



PSCC

STATE OF ARIZONA PUBLIC SAFETY COMMUNICATIONS COMMISSION

DRAFT

STATEWIDE INTEROPERABILITY COMMUNICATIONS PLAN



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EXECUTIVE OVERVIEW

This *Arizona Statewide Communications Interoperability Plan* (SCIP) serves as a reference for all public safety officials as an information source that describes the status of statewide interoperable communications within our state, and the goals and objectives the state is pursuing to improve public safety communications. To ensure that this plan has the support of all levels of government, the Public Safety Planning Commission (PSCC) through their working group, the Statewide Interoperability Executive Committee (SIEC) held a series of regional forums. These forums sought the opinions and council of all levels of government to produce a truly statewide interoperability plan that could be used by all first and initial responders in Arizona.

This is the first of what Arizona State believes will be many statewide planning efforts that provide the opportunity for all levels of government to come together and share their communications needs, and their hopes for the future. This collaboration will further efforts for all levels of government to partner with each other, to work on issues that they share, to find answers to problems, and to continue looking to the future together. As this process matures, subsequent versions of this plan will start forming, with new objectives and new possibilities for the future. All governments, state, local, tribal, and federal, will start working collaboratively with a single focus on new issues and opportunities, to implement new solutions in team spirit, with measurable outcomes, in cost effective and highly productive ways, each achieving a better, more efficient means of communications interoperability.

The Arizona SCIP is based upon the *Office for Interoperability and Compatibility U.S. Department of Homeland Security Statewide Interoperability Planning Guidebook*, May 2007 criteria. This guide and criteria described therein helps to define an actionable way for first responders and their leadership to improve public safety response to emergencies through interoperability.



Throughout this document, the SAFECOM Interoperability Continuum was used as a guidepost to provide a clear and concise method to determine levels of interoperability, governance, and technology.

Using this process, Arizona has outlined their key components for interoperability as follows.

- The long-range goal for the state is to create a statewide 700 MHz Project 25 standards-based, fully interoperable radio system. This system will be used by all state agencies, and any local, tribal, and federal entities who wish to join.
- As this statewide system is in its infancy, a short-term goal for the state is to create a statewide suite of interoperable radios that can be used by any emergency responder (who signs a Memorandum of Understanding). This suite of interoperable radios, known as the Arizona Interagency Radio System (AIRS) will stay in place in Arizona long after the statewide 700 MHz system is deployed. There will always be a need for AIRS as responders come into Arizona through mutual aid programs to deliver aid to Arizonians.
- To make the 700 MHz radio system operational, and to assist AIRS, an updated microwave radio system is also required. This microwave system is being installed in three phases; with phase one implementation this year.
- To assist local governments prepare to join the 700 MHz statewide radio system, the state is looking toward local governments to improve their 800 MHz radio systems so when the statewide 700 MHz radios are deployed, each will be able to connect with each other.
- To ensure the state's investment in 700 MHz technology is as successful as possible, the state is urging locals to prepare their legacy systems to enable connectivity and compatibility to the new network.



- There will always be the need for short-term, immediate assistance for those levels of government who chose not to join the state system. It is for them, that the state will be working towards a system of other interconnectivity devices. These devices will enable local governments who choose to remain with their own radio systems to do so, and connect with the state, only when they choose to do so.

The SAFECOM program recommend the use of the Communications Interoperability Continuum (Continuum) as a tool to help the emergency response community and policy makers measure, analyze and address critical elements required for success as they plan and implement their short- and long-term interoperability efforts. The Arizona SCIP is based upon this SAFECOM methodology. The Continuum depicts the core facets of interoperability according to the stated needs and challenges of the emergency response community. The elements of interoperability defined in the Continuum¹ include governance, standard operating procedures (SOPs), technology, training and exercises and usage.

There is still much to do in Arizona. The SCIP sustains the momentum of the PSCC and SIEC's planning efforts by maintaining long-standing local and regional planning within the statewide process. This document also identifies gaps in interoperability and helps the state in identifying ways to close those gaps in a collaborative, timely manner.

As with the planning efforts of the PSCC, that has sustained itself over these last seven years, interoperability planning goes well beyond the state levels of authority. Interoperability must start at a local government level and work its

¹

<http://www.mshp.dps.mo.gov/MSHPWeb/PatrolDivisions/COMM/SAFECOMInteroperabilityBrochure.pdf>



way upward, synchronizing stakeholders along the way. Through the PSCC, the SIEC, and this plan, local participation is ensured and is integral to this state's strategic planning process.



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Statewide Communications Interoperability Plan

1.0 INTRODUCTION

The state of Arizona created the Public Safety Communications Commission (PSCC) in April 2000. PSCC's mission is to:

- promote the development and use of standards-based (radio) systems
- capitalize on resource-sharing opportunities
- apply best practices and lessons learned
- provide effective, reliable, and sustainable radio communications among local, county, state, tribal, and federal public safety entities
- build a statewide interoperable emergency communications infrastructure that will improve emergency response times and coverage for life safety and critical infrastructure protection evolving needs of state

The state of Arizona's Statewide Interoperability Executive Committee (SIEC) is a five-member PSCC subcommittee representing a broad cross-section of public safety in the state of Arizona.

In 2006, the PSCC awarded a contract to Federal Engineering, Inc. (**FE**) to work in concert with the PSCC and the SIEC to create a statewide interoperable radio system for public safety agencies throughout the state of Arizona. **FE** recommended to the PSCC that it deploy a statewide 700 MHz standards-based land mobile radio system. This recommendation was made in part due to the 700 MHz band being unused, providing the state a clear-channel migration approach for all users.

On April 24, 2007, the PSCC voted to accept this recommendation and the plan was adopted. The PSCC accepted the concept of the statewide radio system for state agencies, with the ability for local and tribal agencies to participate by using the system or interfacing their system to the statewide system. This statewide radio system will become the interoperability solution of choice for the state of Arizona.

This plan represents the short-and long-term goals and strategies of the PSCC in designing and implementing their vision. It demonstrates Arizona's commitment



to her citizens by providing an almost immediate solution to the interoperability problem in the state, but also discusses the long-term solution that promises to protect the lives and property of those who are proud to call Arizona their home.



2.0 BACKGROUND

This Statewide Communications Interoperability Plan (SCIP) is a collaborative effort involving the PSCC and SIEC and other interested parties invited to participate in its formulation. The PSCC contracted with **FE** to assist with its documentation and authorship.

The first organizational meeting to discuss SCIP requirements was held in July 2007 with the SIEC, the PSCC, **FE**, and ICTAP (Interoperable Communications Technical Assistance Program) staff attending. During this meeting, ICTAP explained SCIP requirements and offered the PSCC assistance in reviewing the plan.

A contract retaining Data Site Consortium, Inc. who in turn subcontracted with **FE** to assist in gathering information and authoring the SCIP was executed on August 14, 2007.

The **FE** Project Team met to discuss this project and created a draft *Gap Analysis and Closure Plan* as a guide for collecting the additional information required for this report.

On August 15, 2007, the kickoff meeting with the SCIP team was held in Phoenix, AZ, during which PSCC and SIEC shared all available information with the **FE** Project Team. After reviewing the information, the team created a *Gap Analysis and Closure Plan* outlining what was required to complete the SCIP.

The Project Team began interviewing key individuals for this project on August 15, 2007 and interviews continued until the submission of this document. These interviews were based on questions developed while drafting the *Gap Analysis and Closure Plan*, and were posed to obtain accurate and, when applicable, measurable responses.

On August 25, 2007, **FE** sent the first draft of the SCIP to Arizona Project Team for review. Work continued on the draft until August 30, 2007. Any modifications of the draft by the state will be included in this draft.

On August 31, 2007, this plan is scheduled for review by the Interoperable Communications Technical Assistance Program (ICTAP). This review is scheduled for completion by September 21, 2007, with the SCIP being submitted to the



Department of Homeland Security no later than December 3, 2007. Table 1 below shows the deliverables and their milestones.

Deliverables / Milestones	Dates
Project Initiation	August 13, 2007
Work with SIEC and PSCC to determine what information is available from information resources and from ICTAP	August 15, 2007
Deliver required information list to the state	August 17, 2007
Gap Analysis and Closure Plan	August 18, 2007
Draft Plan to PSCC	August 25, 2007
Draft Plan to ICTAP	August 31, 2007
Updated preliminary Plan to PSCC	September 19, 2007
SIEC and PSCC Plan approval	September 25, 2007
Deliver Plan to DHS	December 3, 2007
Teleconference Status Reports	Weekly

TABLE 1-PROJECT TIMELINE

2.1.0 STATE OVERVIEW

2.1.0.1 GEOGRAPHY

The state of Arizona is located in the southwestern United States. It is bordered to the south by Mexico, to the east by New Mexico, to the north by Utah, and to the north and west by Nevada, and to the west by California. At the northeast corner of the state is the "four corners" where Colorado is on the opposite



corner from Arizona, with New Mexico and Utah in between. Figure 1 is a map of Arizona including its immediate neighbors.

Arizona measures approximately 400 miles long and 310 miles wide and has a total area of roughly 118,000 square miles, making Arizona the sixth largest state in the United States. Arizona has a water area of roughly 364 square miles, making it the third driest state in the U.S., after New Mexico and Wyoming.

The border with Mexico is 366 miles long and is mostly uninhabited. There are six international crossing stations along the border; however, due to the rugged terrain, monitoring illegal activity along the entire international border is currently not cost effective and as a result, illegal border-crossing activities proliferate.



2.1.0.2 DEMOGRAPHICS

The state of Arizona has fifteen (15) counties, which are mostly rural and have diverse topographies. (Figure 2) There are three distinct topographical regions in the state: (1) in the northeast is a high plateau with elevations from 5,000 to 7,000 feet; (2) in the southeast and northwest is a mountainous region with elevations between 9,000 and 12,000 feet; and (3) the low mountains occupying the southwest portion of the state.

FIGURE 1 - MAP OF ARIZONA

The population of Arizona is growing rapidly, with Phoenix being one of the fastest growing cities in the United States. It is estimated that in 2009, Arizona will be home to 6.8 million people, with the Phoenix metropolitan area having a



population of 4.1 million. Table 2 outlines Arizona's population by county and growth projections through 2009. Figure 2 shows the political boundaries of the counties.

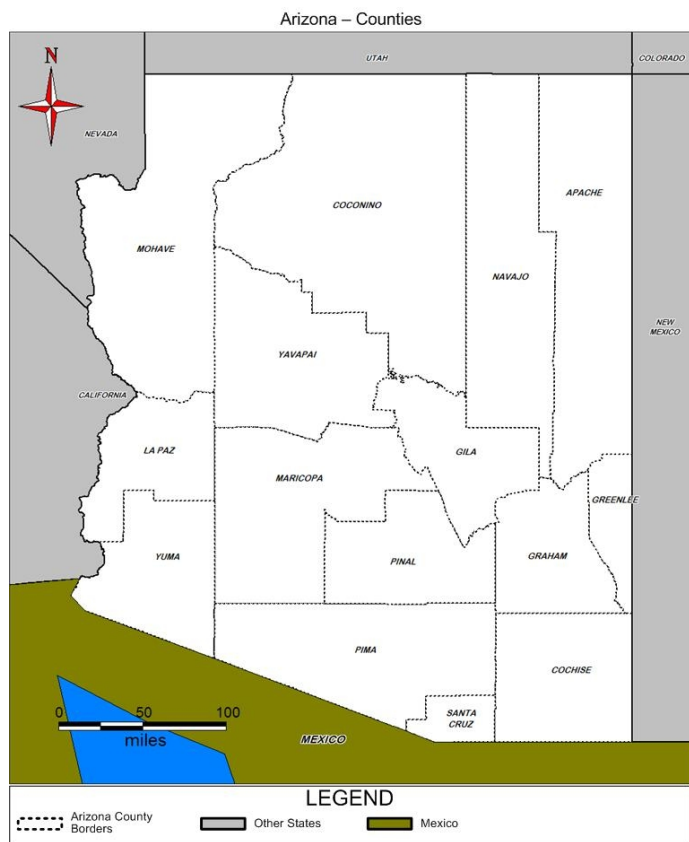


FIGURE 2- COUNTIES OF ARIZONA

Population of Arizona				
Year	2006	2007	2008	2009
Arizona	6,239,482	6,432,007	6,622,885	6,812,137
Apache	74,691	75,597	76,486	77,361
Cochise	134,789	137,708	140,560	143,346



Coconino	132,826	135,070	137,261	139,388
Gila	55,102	55,769	56,427	57,092
Graham	35,873	36,271	36,666	37,054
Year	2006	2007	2008	2009
Greenlee	8,281	8,259	8,238	8,220
La Paz	21,489	21,779	22,062	22,347
Maricopa	3,764,446	3,879,150	3,992,887	4,105,623
Mohave	194,920	201,693	208,372	214,949
Navajo	112,672	115,331	117,971	120,591
Pima	980,977	1,003,918	1,026,506	1,048,796
Pinal	269,892	293,312	316,899	340,660
Santa Cruz	45,303	46,545	47,777	48,998
Yavapai	212,722	220,170	227,468	234,626
Yuma	195,499	201,435	207,305	213,086

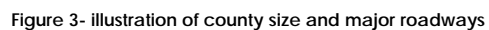
TABLE 2 - POPULATION SUMMARY, ARIZONA²

As described in Table 2 (above), Arizona's population is rising very quickly. More than half of the state's population resides in Maricopa County, a designated Urban Area Security Initiative (UASI) area. The state's second UASI area is Pima County, which is the second most populated county in Arizona. Moreover, the population of the state's six largest counties accounts for over 85-percent of Arizona's total population. The capital, Phoenix, (located in Maricopa County) is the fifth or sixth largest city in the United States.

The 2005 census found that 26.6 percent of the population were under the age of 18 and 12.8 percent were 65 years of age or older. Arizona continues to grow rapidly as a leading retirement destination for people with communities like Sun City (near Phoenix,) and Green Valley (near Tucson) growing much faster than most cities. As shown in Figure 2, Arizona is made up of 15 counties: Mohave,

² Table taken from the *Arizona Workforce Informer*
<http://www.workforce.az.gov/?PAGEID=67&SUBID=138>

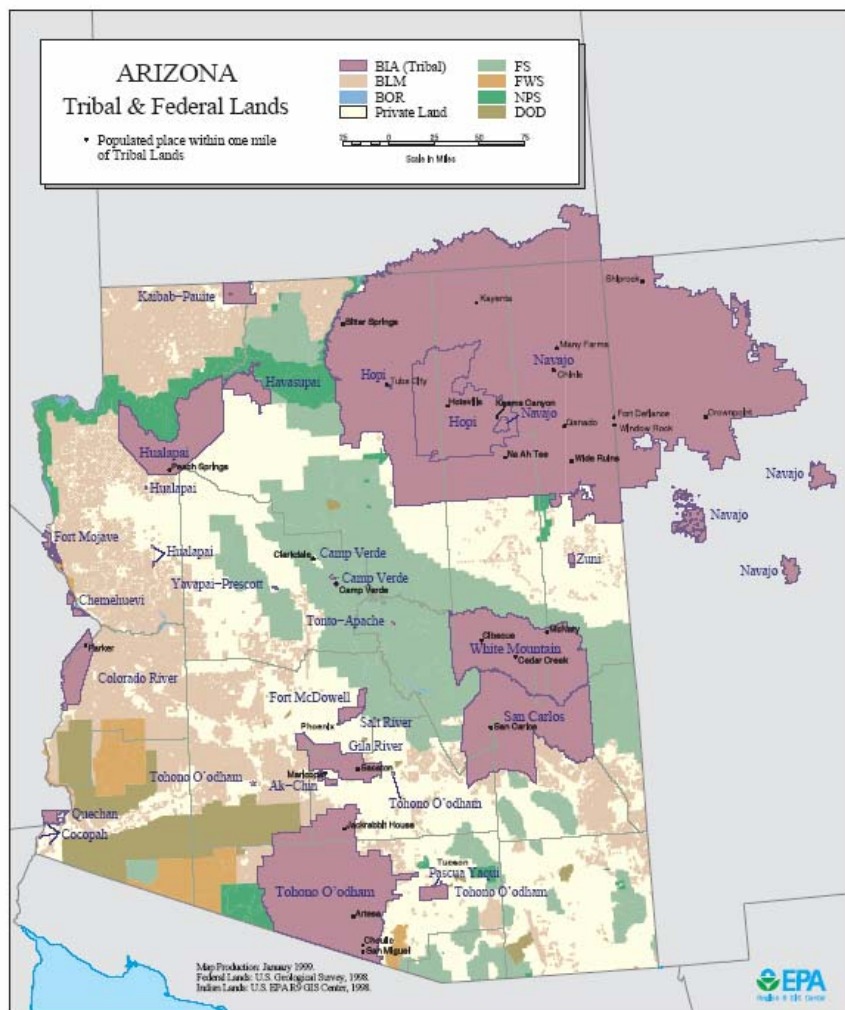




Tribal Lands in Arizona

Arizona is the home of 21 federally recognized tribes. The landmass occupied by all of the tribal nations represents approximately 25% of the land in Arizona, with the Navajo Nation occupying over 16 million acres of land alone. According to the 2000 federal census, the Native American population in Arizona is over 250,000. The map in Figure 4 below represents the locations and size of the Tribal lands in the state.



FIGURE 4 - ARIZONA TRIBAL AND FEDERAL LANDS³

Federal lands

Comment [DBH1]: Additional information will be included in next draft of this SCIP.

Additional information is needed from DoD, BLM, AZ Dept of Lands, etc.

³ <http://www.epa.gov/region9/indian/mapaz.pdf>



As seen in Figure 4 above there is a significant amount of federal lands in the state of Arizona.

There are also key national military bases such as:

- Fort Huachuca, Home to the US Army Intelligence Center and School,
- Luke Air Force base, Home of the 56th Fighter Wing, only facility to train F-16 Fighting pilots
- [Davis-Monthan Air Force Base](#)
- Yuma Proving Grounds
-

2.1.0.3 FIRST RESPONDERS

The state has XXX first responders, with 15 sheriff's departments, 89 police departments, 117 fire districts and XX emergency medical providers. Additionally, the state's Department of Public Safety, XXX, XXX and XXX are considered first responders. Tables 3-6 list emergency response agencies and the radio systems they use. Table 7 is a compilation of this information showing how spectrum is used within the emergency responder community within Arizona.

Comment [DBH2]: We will check with Fire Chiefs Assoc on the number of FD.

Additional information on the number of calls for service, etc. from Fire Chiefs and P.O.S.T., AZ DPS in next draft

COUNTY SHERIFF RADIO FREQUENCY BANDS					
COUNTY	VHF	UHF	800	800	800
	CONV	CONV	CONV	TRUNK	P-25
APACHE COUNTY	X				
COCHISE COUNTY	X				
COCONINO COUNTY	X				
GILA COUNTY	X				
GRAHAM COUNTY	X				
GREENLEE COUNTY		X			
LA PAZ COUNTY	X				
MARICOPA COUNTY				X	
MOHAVE COUNTY	X				
NAVAJO COUNTY	X				
PIMA COUNTY				X	
PINAL COUNTY	X				
SANTA CRUZ COUNTY	X				
YAVAPAI COUNTY	X				
YUMA COUNTY	X				

TABLE 3 - COUNTY SHERIFF FREQUENCY BANDS



CITY AGENCY FREQUENCY BANDS					
CITY	VHF	UHF	800	800	800
(BY COUNTY)	CONV	CONV	CONV	TRUNK	P-25
APACHE COUNTY					
EAGAR	X				
SPRINGERVILLE	X				
ST. JOHNS	X				
COCHISE COUNTY					
BENSON	X				
BISBEE	X				
DOUGLAS	X				
HUACHUCA CITY		X			
SIERRA VISTA	X				
TOMBSTONE	X				
WILLCOX	X				
COCONINO COUNTY					
FLAGSTAFF	X			X	
FREDONIA	X				
PAGE	X				
SEDONA	X	X			
WILLIAMS	X				
GILA COUNTY					
GLOBE	X				
HAYDEN					
MIAMI	X				
PAYSON	X				
GRAHAM COUNTY					
PIMA	X				
SAFFORD	X				
THATCHER	X				
GREENLEE COUNTY					
CLIFTON	X				
LA PAZ COUNTY					
PARKER	X				
QUARTZSITE	X				



CITY AGENCY FREQUENCY BANDS (Continued)					
CITY	VHF	UHF	800	800	800
(BY COUNTY)	CONV	CONV	CONV	TRUNK	P-25
MARICOPA COUNTY					
AVONDALE		X			
BUCKEYE		X			
CHANDLER				X	
EL MIRAGE		X			
GILBERT					X
GLENDALE				X	
GOODYEAR			X		
MESA					X
PARADISE VALLEY		X			
PEORIA		X			
PHOENIX					X
SCOTTSDALE				X	
SURPRISE				X	
TEMPE				X	
TOLLESON			X		
WICKENBURG	X				
YOUNGTOWN		X			
MOHAVE COUNTY					
BULLHEAD CITY	X				
COLORADO CITY	X				
KINGMAN	X				
LAKE HAVASU				X	
NAVAJO COUNTY					
HOLBROOK	X				
PINETOP-LAKESIDE	X				
SHOW LOW	X				
SNOWFLAKE-TAYLOR	X				
WINSLOW	X				
PIMA COUNTY					
MARANA					X
ORO VALLEY		X			
SAHUARITA		X			
SOUTH TUCSON	X				
TUCSON	X	X			



CITY AGENCY FREQUENCY BANDS (Continued)					
CITY	VHF	UHF	800	800	800
(BY COUNTY)	CONV	CONV	CONV	TRUNK	P-25
PINAL COUNTY					
APACHE JUNCTION	X				
CASA GRANDE	X				
COOLIDGE	X				
ELOY	X				
FLORENCE	X				
KEARNY	X				
MAMMOTH	X				
SUPERIOR	X				
SANTA CRUZ COUNTY					
NOGALES	X				
PATAGONIA	X				
YAVAPAI COUNTY					
CAMP VERDE	X				
CHINO VALLEY	X				
CLARKDALE	X				
COTTONWOOD	X				
JEROME	X				
PRESCOTT	X				
PRESCOTT VALLEY	X				
SEDONA	X	X			
YUMA COUNTY					
SAN LUIS	X				
SOMERTON	X				
WELLTON	X				
YUMA				X	
TOTAL AGENCIES BY BAND	55	12	2	8	4

TABLE 4 - CITY FREQUENCY BAND BY COUNTY



FIRE DISTRICTS RADIO FREQUENCY BANDS					
FIRE DISTRICT	VHF CONV	UHF CONV	800 CONV	800 TRUNK	800 P-25
AGUILA	X				
ALPINE	X				
APACHE JUNCTION	X				
ASHFORK					
AVRA VALLEY					
BABOCOMARI					
BOWIE	X				
BEAVER VALLEY	X				
BLACK CANYON	X				
BLUE RIDGE	X				
BUCKEYE VALLEY	X				
BUCKSKIN	X				
BULLHEAD CITY	X				
CAMP VERDE	X				
CENTRAL HIGHTS					
CENTRAL YAVAPAI	X				
CHINO VALLEY	X				
CHLORIDE	X				
CHRISTOPHER KOHLS					
CIRCLE CITY-MORRISTOWN	X				
CLAY SPRINGS-PINEDALE	X				
COLORADO CITY	X				
CONGRESS	X				
CORNVILLE-PAGE SPRINGS					
CORONA DE TUCSON		X			
CROWN KING	X				
DAISY MOUNTAIN					
DESERT HILLS					
DIAMOND STAR					
DONEY PARK	X				
DREXEL HEIGHTS		X			
DUDLEYVILLE	X				
DUNCAN VALLEY					
EAST VERDE PARK					
EHRENBERG	X				
ELFRIDA		X			
ELOY	X				
FOREST LAKES	X				



FIRE DISTRICTS RADIO FREQUENCY BANDS (Continued)					
FIRE DISTRICT	VHF CONV	UHF CONV	800 CONV	800 TRUNK	800 P-25
FORT MOHAVE					
FORT VALLEY					
FOUNTAIN HILLS	X				
FRY					
GANADO	X				
GILA BEND					
GISELA VALLEY					
GOLDEN SHORES					
GOLDEN VALLEY	X				
GOLDER RANCH	X				
GRAPEVINE MESA	X				
GREEN VALLEY	X				
GREENHAVEN					
GREER		X			
GROOM CREEK					
HARQUAHALA VALLEY	X				
HEBER-OVERGAARD	X				
HIGHLANDS	X				
HUALAPAI VALLEY					
JOSEPH CITY	X				
JUNIPINE	X				
KAIBAB ESTATES					
LA CANADA					
LAKE MOHAVE RANCHOS					
LAKESIDE	X				
LAVEEN	X				
LINDEN					
MAMMOTH	X				
MARICOPA					
MAYER		X			
MESA DEL CABALLO					
MOHAVE VALLEY	X				
MONTEZUMA-RIMROCK	X				
MORMAN LAKE	X				
MOUNT ELDON					
MT. LEMMON		X			
NACO	X				
NOGALES SUBURBAN	X				
NORTHWEST	X				



FIRE DISTRICTS RADIO FREQUENCY BANDS (Continued)					
FIRE DISTRICT	VHF CONV	UHF CONV	800 CONV	800 TRUNK	800 P-25
OATMAN		X			
ORACLE VOLUNTEER					
PALO VERDE					
PARKER					
PARKS-BELEMONT	X				
PBW					
PEEPLES VALLEY	X				
PICTURE ROCKS					
PIMA RURAL					
PINE DELL					
PINE LAKE					
PINE-STRAWBERRY	X				
PINETOP					
PINEWOOD	X				
PINION PINE					
PLEASANT VALLEY	X				
PUERCO VALLEY		X			
QUARTZSITE					
QUEEN VALLEY	X	X			
RINCON VALLEY		X			
RIO RICO	X				
RIO VERDE					
SABINO VISTA					
SAFFORD RURAL					
SALOME		X			
SAN MANUEL	X	X			
SEDONA	X				
SELIGMAN	X				
SHERWOOD FOREST ESTATES	X				
SHOW LOW	X				
STANFIELD					
SUN CITY		X			
SUN CITY WEST					
SUN LAKES		X			
SUNNY SIDE					
SUNSITES-PEARCE		X			
THREE POINTS					
TIMBERLINE-FERNWOOD	X				
TONOPAH VALLEY	X				



FIRE DISTRICTS RADIO FREQUENCY BANDS (Continued)					
FIRE DISTRICT	VHF CONV	UHF CONV	800 CONV	800 TRUNK	800 P-25
TONTO BASIN	X				
TONTO VILLAGE					
TRI-CITY					
TRUXTON					
TUBAC		X			
TUCSON C.C. ESTATES					
TUCSON ESTATES					
TUSAYAN	X				
VALLEY VISTA					
VERDE RURAL					
WHETSTONE					
WHISPERING PINES					
WHITE MOUNTAIN LAKE	X				
WHY	X				
WICKENBURG RURAL					
WITTMAN	X				
WOODRUFF					
YARNELL	X				
YUCCA	X				

TABLE 5 - FIRE DISTRICT FREQUENCY BANDS



TRIBAL AGENCIES RADIO FREQUENCY BANDS					
TRIBAL NATION	VHF	UHF	800	800	800
	CONV	CONV	CONV	TRUNK	P-25
AK-CHIN		X			
COCOPAHI	X				
COLORADO RIVER		X			
FORT MCDOWELL		X			
FORT MOHAVE	X				
GILA RIVER			X		
HOPÍ RESOURSE	X				
HUALAPAI	X	X			
NAVAJO DPS	X	X			
PASCUA YAQUI			X		
QUECHAN	X				
SALT RIVER	X	X			
SAN CARLOS	X	X			
TOHONO O'ODHAM			X		
WHITE MTN APACHE	X				
YAVAPAI-PRESCOTT		X			
YAVAPAI-APACHE	X				

TABLE 6 - TRIBAL AGENCY FREQUENCY BANDS

SUMMARY OF RADIO BANDS USED BY AGENCIES IN ARIZONA					
ENTITY	VHF	UHF	800	800	800
	CONV	CONV	CONV	TRUNK	P-25
STATE AGENCIES	7	6	1	1	0
COUNTY SHERIFFS	12	1	0	2	0
CITIES	54	10	2	8	4
FIRE DISTRICTS	65	16	0	0	0
TRIBAL NATIONS	10	9	3	0	0
TOTALS	141	36	5	10	4

TABLE 7- RADIO FREQUENCIES USED IN ARIZONA



2.1.0.4 CLIMATE

The climate in Arizona can be unforgiving, with winter low temperatures in the state's higher elevations often seen below -35° Fahrenheit (F) and summer high temperatures reaching over 120°F or more. The difference between maximum and minimum daily temperatures can be as much as fifty to sixty degrees Fahrenheit during the drier portions of the year. During winter months, daytime temperatures average 70°F, with night temperatures often falling to freezing or slightly below in the lower desert valleys. In the summer, the pine-clad forests in the central part of the state may have afternoon temperatures of 80°F, while night temperatures drop to 35°F or 40°F.⁴

2.1.0.5 CRITICAL INFRASTRUCTURE

Comment [DBH3]: Our intent is to continue trying to contact him and update this section for the next draft of this document.

2.1.0.5.1 WATER SUPPLY

Because Arizona is located in an arid region, it relies on a water supply not indigenous to its population centers. As a result, the state has over 400 dams, of which 130 are classified as requiring critical infrastructure protection. By this definition, the state believes that the failure of one of these assets could result in a high loss of life and/or property within the region.

To best make use of the surface water when and where it is needed, highly elaborate storage reservoirs (which include many of Arizona's largest dams) and delivery systems were constructed throughout the state. The reservoirs on the Salt, Verde, Gila, and Agua Fria rivers are amongst the most noteworthy in the state. A threat to any of these reservoirs would by definition present a serious threat to the region.

The Hoover Dam is the most notable dam in the state and is a major component of the state's infrastructure because of the lakes, water supply, and hydroelectric production linked to its operation. Additionally, as Hoover Dam is known worldwide, it is considered a likely terrorist target. At 726 feet in height

⁴ *Climate of Arizona*



and 1,244 feet in length, it creates the largest fresh water reservoir in the United States.

2.1.0.5.2 ELECTRICITY

As mentioned above, the Hoover Dam and many of the 400 other dams throughout the state are also used to generate hydroelectric power. The Hoover Dam is a major supplier of electric power to the western grid, which includes the states of Arizona, California, and Nevada.

Arizona is also home to the largest nuclear power generation facility in the United States. The Palo Verde Nuclear Generating Station is located near Wintersburg, Arizona, about 45 miles west of central Phoenix and produces over 30,000 giga-watt-hours of electricity annually to serve approximately four million people. The high-profile facility sits on 4,000 acres of land and is a major source of power for Phoenix and southern California. The Nuclear Regulatory Commission also recently placed Palo Verde into a high risk "Category 4", making it the most monitored nuclear power plant in the United States. It is notable that during the Cold War the Soviet Union targeted Palo Verde in its nuclear war planning scenarios.

2.1.0.5.3 BANKING

Since Arizona's largest industry is tourism, it follows that the infrastructure, including banking, required to support it is critical to maintain. Several banks also sustain call center operations in Arizona.

2.1.0.5.4 AIRPORTS

Arizona has forty-seven airports, listed in Table 8 and shown visually in Figure 5 below. These airports provide vital links to the state for both tourism and day-to-day operations. As tourism is such a large industry in Arizona, with visitors coming from around the world, the state's airports, especially Phoenix International (Sky Harbor), provide convenient access. Many regional and private airports provide additional links used for transportation and industry as well as tourism.



<i>Bagdad</i>	<i>Nogales Intl</i>
<i>Bisbee</i>	<i>Page</i>
<i>Buckeye</i>	<i>Payson</i>
<i>Bullhead City - Laughlin</i>	<i>Peach Springs</i>
<i>Casa Grande Municipal</i>	<i>Phoenix Deer Valley</i>
<i>Chandler Stellar</i>	<i>Phoenix Intl</i>
<i>Chandler Williams</i>	<i>Phoenix Luke AFB</i>
<i>Clifton</i>	<i>Phoenix Sky Harbor</i>
<i>Cottonwood</i>	<i>Polacca</i>
<i>Douglas Bis/Doug</i>	<i>Prescott</i>
<i>Douglas Municipal</i>	<i>Safford</i>
<i>Flagstaff</i>	<i>Sedona</i>
<i>Fort Huachuca/Sr. Vista</i>	<i>Show Low</i>
<i>Goodyear Litchfield</i>	<i>St. Johns</i>
<i>Grand Canyon</i>	<i>Taylor</i>
<i>Grand Canyon Hlpt</i>	<i>Tuba City</i>
<i>Grand Canyon North Rim</i>	<i>Tucson- Avra Valley</i>
<i>Havasupai</i>	<i>Tucson Davis Monthan AFB</i>
<i>Kayenta Monument</i>	<i>Tucson Intl</i>
<i>Kingman</i>	<i>Valle Robidoux</i>
<i>Lake Havasu City Municipal</i>	<i>Whiteriver</i>
<i>Marble Canyon</i>	<i>Winslow</i>
<i>Mesa Falcon Field</i>	<i>Yuma</i>
	<i>Yuma Laguna</i>

TABLE 8- ARIZONA'S AIRPORTS ⁵

⁵ Information in Airports from *Airport City Codes*
<http://www.airportcitycodes.com/statewisecodes.aspx>



Arizona Airports

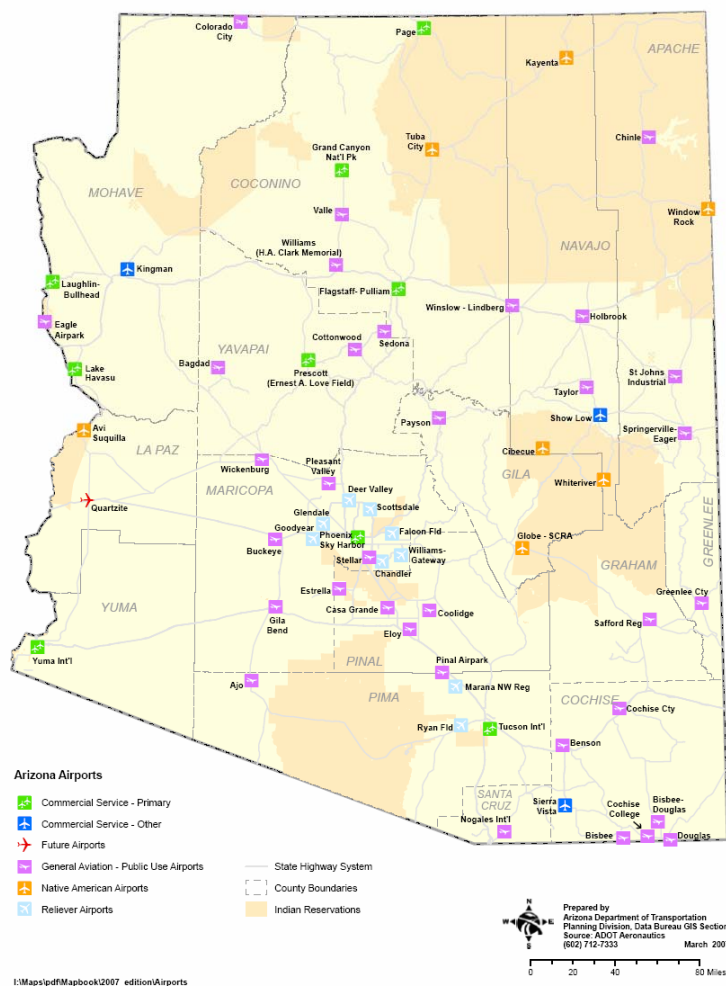


FIGURE 5- ARIZONA'S AIRPORTS⁶

Other critical infrastructure as defined by ADHS

Comment [DBH4]: This section will be expanded after discussing with AZ DHS

2.1.0.6

ROADWAYS

⁶ Map provided by Arizona Department of Transportation



2.1.0.6.1 INTERSTATE HIGHWAY SYSTEM

Five interstate highways (8, 10, 19, 40 and 17) transect the state and play major roles in its commerce and transportation environment. Interstates 10 and 40 traverse the state from its eastern border to its western border. Interstate 10 is the east-west corridor along Arizona's south, while Interstate 40 serves as the east-west corridor in the north-central region of the state. Interstates 17 and 19 are north-south and are entirely within the state. I-8 starts within the state and travels west until it reaches the Pacific Ocean at San Diego. A disruption to any of these roadways could be devastating for commerce on both coasts of the U.S. as they are part of the highway system connecting the entire U.S.

2.1.0.6.2 SECONDARY HIGHWAYS

According to the Arizona Department of Transportation (ADOT), there are several secondary roadways critical for the state's vitality. This is especially true should emergency evacuations be required. These secondary roadways are listed in Table 9 (below).

Secondary Roadways – State Roads			
SR-60	SR-79	SR-89	SR-101
SR-66	SR-86	SR-90	SR-102
SR-71	SR-87	SR-93	SR-180
SR-77	SR-89-A	SR-95	SR-191

TABLE 9 - SECONDARY ROADWAYS

Comment [DBH5]: We plan on doing additional work in this section. We received these roadways on 8/24. Additional data will come from: http://members.tripod.com/~rachela/roads/az_roads.html Will also try to learn more about the CANAMEX Corridor and will add that to the next draft of the report.

2.1.0.6.3 BRIDGES

- Glen Canyon Dam Bridge
- Glen Canyon Bridge, Page
- Navajo Bridge
- Hoover Dam
- Topoc
- Parker

Comment [DBH6]: Additional information will be included in the next draft of this document.



- Yuma
- Blythe
- Needles
- Bull Head City

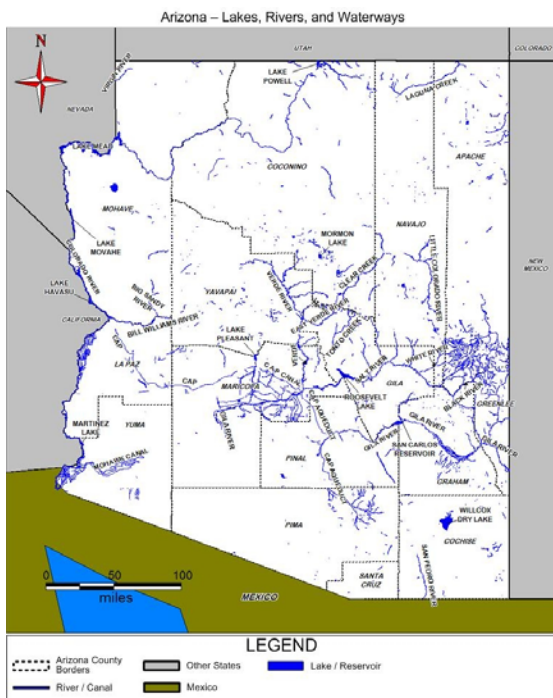
A bridge crossing a waterway may be considered “critical” since there are very few alternate routes available, especially those crossing state borders. Bridges crossing the normally dry Salt and Gila Rivers in and near the Phoenix metro area are critical to allow commuters to travel to and from work. Similarly, several major railroad lines use critical bridges to cross these waterways.

2.1.0.7 WATERWAYS

The major rivers in Arizona are the Colorado, Little Colorado, Gila, Salt, Verde, Santa Cruz and Bill Williams. In addition to these waterways, there are several popular lake destinations, including Lake Mead, Lake Havasu, Lake Mohave,

Theodore Roosevelt Lake, San Carlos Lake, Saguaro Lake, Lake Pleasant, Apache Lake, and Lake Powell.

As mentioned earlier, to best make use of the surface water when and where it is needed, highly elaborate storage reservoirs (including many of Arizona’s lakes) and delivery systems were constructed throughout the state. The reservoirs on the Salt, Verde, Gila, and Agua Fria rivers are among the state’s most noteworthy. In addition, the 336-mile Central Arizona Project (CAP) canal transports Colorado River water from near Parker, into and out of Lake Pleasant, to treatment plants in Phoenix and Tucson. A map with all of Arizona’s lakes, rivers, and waterways is included in this report in Figure 6. Although the map indicates what appear to be many waterways, none provides a transportation



corridor into the state. The waterways are typically controlled to provide water and electricity for the residents of Arizona.

FIGURE 6 - ARIZONA LAKES, RIVERS, AND WATERWAYS

2.1.0.8 MAJOR GEOGRAPHICAL CONSIDERATIONS

Arizona shares a 389-mile border with Mexico, most of which is unregulated and unprotected as its sheer size makes it impossible to patrol adequately with existing Border Patrol resources.

Arizona also has two major desert environments: the lower desert and the high desert. Each has its own special set of requirements for equipment, protection, weather conditions, and environmental concerns.

In north central Arizona are the San Francisco Mountains, situated near the Flagstaff area. These mountains and their associated topography (Humphreys Peak, north of Flagstaff, is 12,633 feet above sea level) present additional challenges to Arizona.

Across the northwest portion of the state is the Grand Canyon, with drops of over 5,000 feet to the Colorado River. The overall geography, coupled with the severe climate makes Arizona's overall environment very challenging and unforgiving.

2.1.0.9 ANNUAL AND UPCOMING EVENTS

2.1.0.9.1 ANNUAL EVENTS

Arizona is the home of six professional sports teams including, the Phoenix Suns (NBA), Arizona Diamondbacks (MLB), Arizona Cardinals (NFL), Phoenix Coyotes (NHL), Phoenix Mercury (WNBA) and the Arizona Rattlers (AFL). Additionally, Arizona hosts major league baseball spring training camps at nine municipal stadiums in the Phoenix/Tucson regions that are visited by tens of thousands each year.



The major sporting venues for these teams include the University of Phoenix Stadium, America West Arena, Chase Field, Arizona State University (ASU) Sun Devil Stadium, Northern Arizona University (NAU), and Glendale Arena. All of these venues, which rank among the largest and most modern in the country, reach sold-out capacity on a regular basis as they are booked throughout the year.

Tempe hosts one of the largest New Years' Eve celebrations in the country, which is attended by approximately 100,000 people.

Phoenix is the home of several world-class parades as well as marathons and walks. Some of these events are as follows:

- Arizona diabetes Association Walk for a Cure (East, West, and Central)—September
- Cactus Cha-cha foot race—October
- Susan G. Komen Race for the Cure—October
- MS Walk on the Wild Side—October
- YMCA Half Marathon—October
- Javalina Jundred 100 mile race—October
- JDRF Walk to Cure Diabetes—November
- Fiesta Bowl Half Marathon—December
- Fiesta Bowl Parade—December
- SRP Cycle for Life—December
- Runners Den Road Classic—February
- Laveen Country Challenge bike race—February
- Lost Dutchman Marathon—February
- Crown King 50k—March
- MS-150 two day bike ride—March
- Highline Trail 50 mile race—April
- Ironman Triathlon—April

In addition, the Phoenix area also plays host to one of the best-attended golf tournaments in the world each year. The event, now called the Fred Billings Ramsey Group, Inc (FBR) Open, regularly draws over 500,000 spectators during tournament week, which makes it one of the largest recurring spectator events in the nation. Phoenix International Raceway hosts NASCAR Nextel Cup events twice a year, bringing many thousands of fans to the area.



Because the southern half of Arizona is known for its warm and dry winter weather, communities in this part of the state, especially those in the Phoenix area, play host to a multitude of large-scale, high-profile events during the months of November through February. Like the major sporting activities, these events will also draw thousands of visitors.

- Tucson Film and Music Festival
- Arizona Film Festival
- Sedona Jazz on the Rocks

Further evidence of Arizona's incredible drawing power during the winter months is that many communities in the southern half of the state will cite two population figures: one for the summer and another for winter, when many thousands of "snowbirds" – retirees still living part time in colder climates – make their annual migration to Arizona.

Comment [DBH7]: We are still gathering information to fill in here.

Additional information will be included in the next draft of this document.

2.1.0.9.2 UPCOMING EVENTS

In addition to the many annual events that Arizona hosts, many onetime events take place in the state. Most notable is the 2008 Super Bowl (XLII) hosted in Glendale in the University of Phoenix stadium.

2.1.1 NIMS/MULTI-AGENCY COORDINATION SYSTEM (MCS)

Recognizing the critical nature of coordinating emergency response and communications, President Bush issued Homeland Security Presidential Directive-5 on February 28, 2003. This directive ordered the Secretary of Homeland Security to develop and oversee a new and more advanced Incident Command System (ICS) and is known as the National Incident Management System (NIMS). The goal of this new command system is to provide a consistent nationwide template for all organizations that may work together in a cooperative response to a multi-agency incident. By training in a national standardized program, all government, private sector, and nongovernmental organizations will be better equipped to coordinate and communicate their actions during planning, response, and recovery of domestic incidents.



The state understands the majority of incidents are managed locally. The initial response to most incidents is handled by local 911 dispatch centers, emergency responders within a single jurisdiction, and direct supporters of those emergency responders. When incidents escalate, the need for a scalable command and communications system is required for safety of the responders and efficient use of resources.

In the event of an incident where state assistance is required, the state Emergency Operations Center (EOC) is activated and acts as the Multi-Agency Coordination Center (MCS) for the state. The EOC staffing model uses the NIMS ICS command structure. The resource unit leader in the planning section would be responsible for the inventory and allocation of resources to the incident while maintaining readiness in the remainder of the state. Personnel that have knowledge of each discipline's deployment status assist the Resource Unit Leader. For example, the state EOC may not activate during isolated wildfires. If an incident escalates and requires additional state resources the state EOC would activate. The Resource Unit from the State Land Department briefs the state EOC Resource Unit Leader on the status of fire resources assigned to the incident. The state is divided into five regions with a designated primary dispatch center as the contact point for coordination of each regional response. When the resources deploy to the impacted area, the response to the area of operation is coordinated. The primary contact center monitors the state's interoperable communications, Arizona Interagency Communications System (AIRS). When the responding resources enter into the affected state Homeland Defense region, the primary dispatch center for that region directs the response to a staging area until assigned. The primary dispatch center coordinates the staging of resources until they are assigned to the incident.

The primary contact center and incident Communications Unit Leader (COML) coordinates the use of available frequency spectrum to provide communications for the Incident Commander to ensure safe and effective communications as well as maintain a manageable span of control.

The state currently utilizes several plans (e.g., statewide emergency response and recovery plans, agency business continuity plans and continuity of government planning, etc.) to provide additional resources to county and local governments. The Arizona Department of Lands coordinates wild-lands firefighting that involve state land. The state utilizes pre-established MOUs with local fire departments and fire districts to obtain additional resources (additional

Comment [DBH8]: We are attempting to get additional information for MOUs



information may be found in the *Fire Chiefs Mutual Aid Plan Appendix X*. The state requests and coordinates the assignment of the additional fire resources to the incident. These requests utilize standard fire resource typing. Once assigned to the incident these resources integrate into the ICS command structure following the National Incident Management System.

Comment [DBH9]: ICTAP – Question - As we get this information, should it be included in appendices, or a a reference to a URL OK?

Comment [MCK10]: Need to add the AZ State Land Department's Forestry Division's Emergency Response Plan here. Contact Dale Brown at dalebrown@azstatefire.org

Mutual aid and NIMS

As an example of how the mutual aid system works within the overall state NIMS program, requests for the Phoenix UASI region resources are made through the Phoenix Fire Regional Dispatch Center. Available assets include law enforcement, bomb squad, SWAT, HazMat, Weapons of Mass Destruction (WMD) and CBRN units. Once assets are requested, the City of Phoenix Emergency Operations Center (EOC) will open and notify the County, state EOCs, Arizona Department of Public Safety (DPS) Duty Officer, and City EOCs in the UASI system. They will use common terminology to communicate requests and instructions. Accountability starts at the individual unit level with the local incident commander, and channels up through the command structure as the incident escalates. Department commanding officers are responsible for their agency's resources, county level officials are responsible for the departments, and state officials are responsible for state resources and coordinating the accountability of the committed county/local departments.

2.1.2 REGIONS/JURISDICTIONS

2.1.2.1 COUNTIES

Arizona is comprised of 15 counties. Table 10 lists the cities and towns that comprise each county. Politically, each county has an elected board of supervisors.



APACHE COUNTY Eagar St.Johns Springerville	GRAHAM COUNTY Pima Safford Thatcher	Litchfield Park Mesa Paradise Valley Peoria* Phoenix Queen Creek* Scottsdale Surprise Tempe Tolleson Wickenburg Youngtown	PIMA COUNTY Marana Oro Valley Sahuarita South Tucson Tucson	Cottonwood Dewey-Humboldt Jerome Peoria* Prescott Prescott Valley Sedona*
COCHISE COUNTY Benson Bisbee Douglas Huachuca City Sierra Vista Tombstone Willcox	GREENLEE COUNTY Clifton Duncan		PINAL COUNTY Apache Junction* Casa Grande Coolidge Eloy Florence Kearny Mammoth Maricopa Queen Creek* Superior Winkelman*	YUMA COUNTY San Luis Somerton Wellton Yuma
COCONINO COUNTY Flagstaff Fredonia Page Williams Sedona*	LAPAZ COUNTY Parker Quartzsite	MOHAVE COUNTY Bullhead City Colorado City Kingman Lake Havasu City		
GILA COUNTY Globe Hayden Miami Payson StarValley Winkelman*	MARICOPA COUNTY Apache Junction* Avondale Buckeye Carefree Cave Creek Chandler El Mirage Fountain Hills Gila Bend Gilbert Glendale Goodyear Guadalupe	NAVAJO COUNTY Holbrook Pinetop-Lakeside Show Low Snowflake Taylor Winslow	SANTA CRUZ COUNTY Nogales Patagonia	
			YAVAPAI COUNTY Camp Verde Chino Valley Clarkdale	

**These jurisdiction's incorporated limits are in multiple counties.*

TABLE 10- CITIES AND COUNTIES IN ARIZONA

2.1.2.2 REGIONAL ADVISORY COUNCILS (RACs)

Arizona has created a series of Regional Advisory Councils (see Figure 7 below). The Regions represent the state's geographical divisions for planning and coordination purposes. The RACs are tasked with making recommendations for investments in their regions that align with the state's Homeland Security planning efforts. Table 11 (below) indicates the Homeland Security Region or RAC and their counties.



Homeland Security Regions



FIGURE 7 - HOMELAND SECURITY REGIONS (ALSO KNOWN AS REGIONAL ADVISORY COUNCILS RACS)

<i>Central</i>	<i>East</i>	<i>North</i>	<i>South</i>	<i>West</i>
Maricopa	Gila	Coconino	Pima	Mohave
	Graham	Apache	Cochise	La Paz
	Greenlee	Navajo	Santa Cruz	Yavapai
	Pinal		Yuma	

TABLE 11- RACS BY COUNTY



2.1.3 URBAN AREA SECURITY INITIATIVES (UASI AREAS) / TACTICAL INTEROPERABILITY COMMUNICATIONS PLANS (TIC PLANS)

Today, the Phoenix Urban Area and Tucson Urban Area are designated as UASI regions. The Areas, Regions, and other required information is included in Table 12 below.

<i>UASI Area</i>	<i>Regions / Jurisdictions</i>	<i>TICP Title/ Completion Date</i>	<i>POC Name</i>	<i>POC Email</i>
Phoenix	Maricopa County	<i>Phoenix Urban Area Tactical Interoperable Communications Plan May 2006</i>	Jesse Cooper	jesse.cooper@phoenix.gov
Tucson	Pima County	Does not have a TIPC	Brad Olson	Brad.olson@tucsonaz.gov

TABLE 12-UASI/TIC PLANS

The Phoenix UASI

The Phoenix UASI encompasses all of Maricopa County, which is also the entire Central Region RAC. Figure 8 below illustrates the Phoenix UASI's area.

The Phoenix Area UASI includes the municipalities listed in Table 13 below



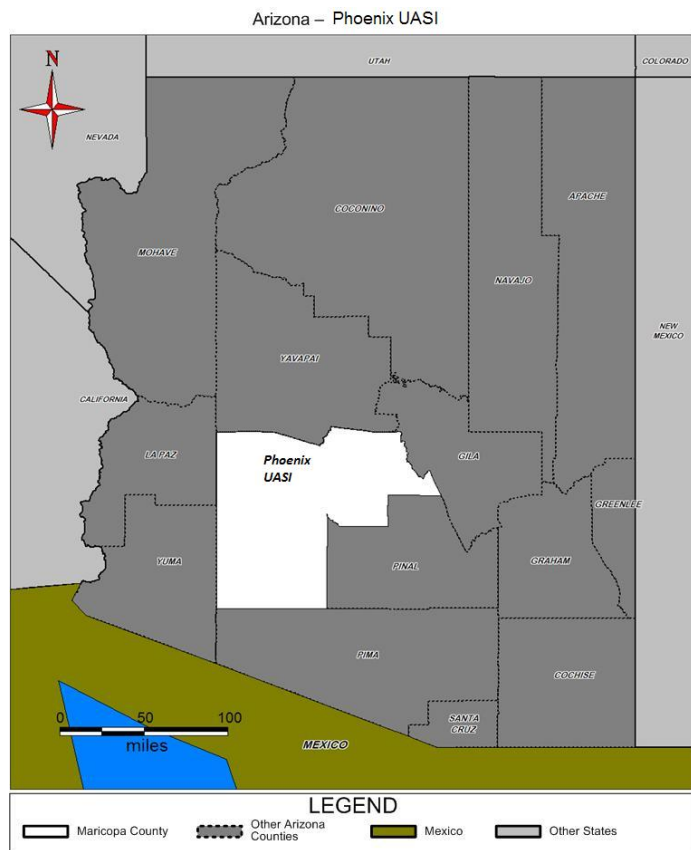


FIGURE 8- PHOENIX UASI- INCLUDES ALL MARICOPA COUNTY

Apache Junction	Paradise Valley
Avondale	Peoria
Buckeye	Phoenix
Carefree	Queen Creek
Cave Creek	Scottsdale
Chandler	Surprise
El Mirage	Tempe
Fountain Hills	Tolleson
Gila Bend	Wickenburg
Gilbert	Youngtown
Glendale	Fort McDowell Indian Community
Goodyear	Gila River Indian Community
Guadalupe	Salt River Pima-Maricopa Indian Community
Litchfield Park	State of Arizona



TABLE 13- PHOENIX UASI CITIES

The Phoenix UASI Area Tactical Interoperability Communications (TIC) Plan, entitled *Phoenix Urban Area Tactical Interoperable Communications Plan*, was completed in May 2006. On August 5, 2006, a full-scale validation exercise was held at the University of Phoenix Stadium. The exercise was performed in conjunction with a scrimmage game and grand opening of the stadium. The results of the Phoenix UASI TIC Plan exercise were documented in an after-action report prepared following the full-scale exercise. Members from ICTAP and DHS were on site to evaluate and validate the Phoenix UASI TIC Plan.

Integration of the TIC Plan

The existing Phoenix UASI TIC Plan captures resources specific to response capabilities within its Urban Area. The Phoenix TIC Plan describes state resources that may be used in times of emergency. Authorized persons may review the Phoenix TIC Plan by contacting the Phoenix UASI or the United States Department of Homeland Security. This Arizona SCIP incorporates the requirements of the Phoenix TIC Plan and is complementary of the work that has been completed in that area.

Tucson advises that they will not be completing a TIC Plan; however, there are members of the Tucson UASI who are also members of the PSSC and work with the Commission, thus assuring alignment of the Tucson UASI and the planning efforts of the state.

Comment [DBH11]: Question for ICTAP – One comment made by ICTAP was to include information from the TIC Plans about their inclusion of mass transit, and private areas. Phoenix TIC Plan was silent on this, and Tucson is not writing a TIC Plan. Can you offer a suggestion for us?

Arizona has five (5) homeland security regions; each of these regions is required to complete an interoperability plan. While the TIC Plans focus on specific tactical resources available, the SCIP is designed as a strategy document – each TIC Plan will support the overall state strategy (SCIP) and will be developed and revised to ensure that all TIC Plans are in alignment with the SCIP as a resource to provide specific communications resources not documented in the SCIP.

Phoenix TICP Supporting Documents

Tactical Interoperability Plan:

The Phoenix UASI TIC Plan is available in its entirety to authorized personnel via the POC or the www.niix.org website.



After-Action Report:

The complete after-action report is available from the Phoenix UASI POC and is available to authorized personnel via the <https://www.llis.dhs.gov/> website.

Point of Contact:

The Phoenix UASI Area TIC Plan Point of Contacts is:

Phoenix UASI Primary POC:

Name: Jesse W. Cooper
Title: Communications/IT Manager, Phoenix Police Department
Address: 100 E. Elwood Street, Phoenix, Arizona, 85040-1071
Office: 602-534-0315
Mobile: 602-768-4314
E-mail: jesse.cooper@phoenix.gov

Phoenix UASI Alternate POC:

Name: Michael G. Worrell
Title: Captain, Phoenix Fire Department
Address: 150 S. 12th Street, Phoenix, Arizona, 85034
Mobile: 602-370-5232
E-mail: mike.g.worrell@phoenix.gov

The Tucson UASI:

The Tucson UASI area covers the entire Pima County Region, as shown in Figure 9 below.

Tucson was recently designated a UASI region and has not completed a TIC Plan.

Comment [DBH12]: We plan on including a table (similar to 13 above) listing all of the jurisdictions in the Tucson UASI in the next draft of this document.

TIC Plan Integration

It is the intent of the Tucson UASI to incorporate the statewide plan into their planning documents.

POC for the Tucson UASI

Tucson UASI Primary POC:



Name: Brad Olson
Title: Deputy Chief, Tucson Fire Department
Address: 265 S Church Ave, Tucson, AZ 85701
Office: 520-791-4806 x 1210
E-mail: brad.olson@tucsonaz.gov

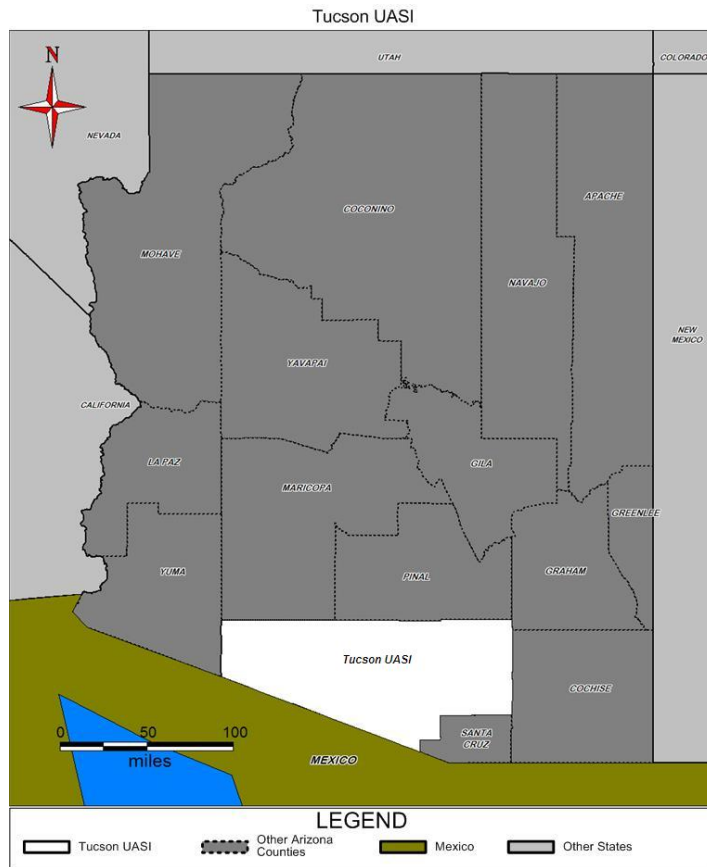


FIGURE 9 - TUCSON UASI - INCLUDES ALL PIMA COUNTY

2.2 PARTICIPATING AGENCIES AND POINTS OF CONTACT

Table 14 below identifies the agencies and individuals that assisted Arizona in developing Arizona's Statewide Interoperability Communications Plan.



Agency Name	Agency POC	POC Email	POC Telephone (s)
AZ Department of Public Safety	Kevin A. Rogers	karogers@azdps.gov	(602) 223-2260
AZ Public Safety Communications Commission	Curt Knight	cknight@azdps.gov	(602) 223-2257
AZ Public Safety Communications Commission	Jeff Miner	jminer@azdps.gov	(602) 271-7403
City of Phoenix	Jesse Cooper	jesse.cooper@phoenix.gov	(602) 534-0315
City of Yuma	Greg Wilkinson	greg.wilkinson@ci.yuma.az.us	(928) 373-4902
Guardian Medical Transport	Mark Venuti	mark.venuti@nahealth.com	(928) 773-2145
Phoenix Fire Department	Mike Worrell, Captain	mike.g.worrell@phoenix.gov	(602) 370-5232
Pima County	Larry Sayers	Larry.sayers@pima.gov	(520) 884-5367
Pima County Sheriff's Office	Paul Wilson, Captain	pwilson@pimasheriff.net	(520) 741-4878
Sedona Fire District	Dan Wills	dwills@sedonafire.org	(928) 300-0137
Arizona Department of Health Services	Ken Leighton-Boster	LEIGHTK@azdhs.gov	(602) 364-3589
AZ State Forestry	Jon Huish	jonhuish@azstatefire.org	(602) 255-4059
Springville Police Department	Steve West	spd@springville.com	(928) 333-4340
Yuma County Sheriff's Department	Leon M. Wilmot	Leon.wilmot@co.yuma.az.us	(928) 783-4427
GITA	Joyce Raschiatore	jraschiatore@azgita.gov	(602) 364-4976
AZ Dept of Lands, Forestry Div	Dale Brown	dalebrown@azstatefire.org	(602) 255-4059
City of Mesa	Mike Dieffenbaugh	Mike.dieffenbaugh@cityofmesa.org	(480) 644-2805

Comment [DBH13]: This table will be augmented by the two upcoming SIEC meetings in September and October.



Agency Name	Agency POC	POC Email	POC Telephone (s)
Gilbert Fire Department	Vies Kemp	wesko@ci.gilbert.az.us	(480) 997-5819
Town of Gilbert	John Glorioso	John.glorioso@ci.gilbert.az.us	(480) 503-6335
Motorola	Andy Lacey	Andrew.lacey@motorola.com	(480) 732-6119
Phoenix Police Department	Jesse W. Cooper	Jesse.cooper@phoenix.gov	(602) 534-0315
Federal Engineering	John Murray	jmurray@fedeng.com	(703) 946-3626
Coconino County Sheriff's Department	Cathy Allen	callen@coconino.az.gov	(928) 226-5017
Tyco Electronics	Steve Howard	howardst@tycoelectronics.com	(480) 839-2500
Pinal County Emergency Management	Pete Weaver	Pete.weaver@co.pinal.az.us	(520) 866-6415
AZ Department of Health Services	Ken Leighton-Boster	leigutk@azdhs.gov	(602) 369-3589
Pima County Sheriff's Department	Paul Wilson	Paul.wilson@sheriff.pima.gov	(520) 741-4878
AZ Department of Public Safety	Scott Tillman	stillman@azdps.gov	(602) 223-2275
City of Yuma	Greg Wilkinson	Greg.wilkinson@ci.yuma.az.us	(928) 373-4902
AZ Department of Health	Tim Singleton	singleton@azdhs.gov	(602) 364-3881
AZ Department of Health	Robert Evans	evansr@azdhs.gov	(602) 364-3886
Phoenix Fire	Louise Smith	Louise.a.smith@phoenix.gov	(602) 534-4822
Yavapai County Sheriff's Department	Steve Francis	Steven.francis@co.yavapai.az.us	(928) 777-7221
Maricopa County Sheriff's Department	Jesse Locksa	j.locksa@mso.maricopa.gov	(602) 876-1000
AZ Department of Public Safety	Andy Miller	amiller@azdps.gov	(928) 773-3710
Gila River Indian Community	Mark Hill	Mark.hill@gric.nsn.us	(920) 610-7116

Comment [DBH13]: This table will be augmented by the two upcoming SIEC meetings in September and October.



<i>Agency Name</i>	<i>Agency POC</i>	<i>POC Email</i>	<i>POC Telephone (s)</i>
Tucson Police Department	Kathleen Robinson	Kathleen.robinson@tucsonaz.gov	(520) 791-4441
La Paz County Sheriff's Department	Karl Hartmetz	khartmetz@lapazsherigg.az.us	(928) 669-6141
Gila County Sheriff's Department	Tom Melcher	tmelcher@co.gila.az.us	(928) 474-2208
AZ DEMA/ADEM	Ryan Goosley	Ryan.goosley@azdema.gov	(602) 231-6342P
Pinal County	Jay Vargo	Jay.vargo@co.pinal.az.us	(520) 866-az.us
City of Casa Grande	Mike Brashier	mikeb@ci.casa-grande.az.us	(520) 421-8711
Northrop Grumman	Woody Dyche	wsyche@aol.com	(505) 975-2275
Motorola	Andy Lacey	Andrew.lacey@motorola.com	(480) 732-6119
Pinal County	Curt Fonger	Curtis.fonger@co.pinal.az.us	(520) 866-5136
Mesa Fire Department	Bruce McGregor	Bruce.mcgregor@cityofmesa.org	(480) 644-3542
Motorola	Mark Bare	Mark.bare@motorola.com	(480) 732-2410
Motorola	William Fleming	William.fleming@motorola.com	(480) 718-9929
Motorola	Michael Paz	Michael.paz@motorola.com	(480) 732-6147
City of Peoria	Carl Reitz	Carl.reitz@peoriaaz.gov	(612) 773-7508
Public Safety Communications Commission	Marcus Aurelius	gmarcusa@cox.net	(623) 580-9276

Comment [DBH13]: This table will be augmented by the two upcoming SIEC meetings in September and October.

TABLE 14- PARTICIPATING AGENCIES AND POINTS OF CONTACT

Plans for interoperability and the proposed statewide radio system have included numerous interviews and questionnaires among consultants, state staff and personnel from most public safety agencies within the state.

The PSCC



In addition, the PSCC has created a body of representatives from a variety of agencies and disciplines. The current commissioners of the PSCC are:

- David Felix, Deputy Director, Arizona Department of Public Safety (Chair)
- Ray W. Allen, Assistant Chief, Tucson Fire Department
- Marcus Aurelius, Emergency Management Coordinator, City of Phoenix
- Amy Brooks, Captain, Apache Junction Fire Department
- Hal Collett, Sheriff, La Paz County / Arizona Sheriffs Association
- Mike Brashier, City of Casa Grande
- Jan Hauk, President, Arizona Fire District Association / Buckeye Valley Fire District
- Richard Miranda, Chief, Tucson Police Department
- Tracy L. Montgomery, Assistant Chief, Phoenix Police Department
- Leesa Berens Morrison, Director, Arizona Department of Homeland Security
- Dora Schiro, Director, Arizona Department of Corrections
- Danny Sharp, Chief, Oro Valley Police Department
- Dan Wills, Battalion Chief, Sedona Fire District
- Dewayne Woodie, Fire Chief, Ganado Fire District
- Michael Worrell, Captain, Phoenix Fire Department

2.3 STATEWIDE PLAN POINT OF CONTACT

The state of Arizona has designated Mr. Curt Knight as its official point of contact. Mr. Knight is a full-time coordinator for the statewide interoperability plan. His contact information is:

Mr. Curt Knight
Executive Director
Public Safety Communications Commission
Mail Drop 3450
PO Box 6638
Phoenix, Arizona
Telephone: 602.271.7400
Email: cknight@azdps.gov

2.4 SCOPE AND TIMEFRAME

This statewide Communications Interoperability Plan (SCIP) provides an approach to achieve interoperability for public safety radio system users in Arizona. It provides for short- and long-term solutions to permit



intercommunications among all entities (public and private, commercial and non-profit, and state, county, local, tribal, and federal.)

This plan identifies the need for an interoperability governance structure under the PSCC's leadership. It shows the state's progress by developing the Arizona Interagency Communications System (AIRS) network. It describes the ultimate solution, a standards-based, common-infrastructure radio system providing communications for all state, local, tribal, and federal participating agencies. The plan also allows for integrating legacy and existing systems and for linking the AIRS network to permit communications with non-participants and transient agencies (which may be agencies, including non-governmental entities that come into the area to provide mutual aid or assistance).

The plan calls for accomplishing several strategic initiatives: Governance, Planning, Technology, Training, and System Replacement. An implementation schedule was created, allowing for continued on-going AIRS implementation, whose support will last indefinitely. The statewide radio system deployment is to be completed by January 1, 2013.



3.0 METHODOLOGY

Arizona has made a sincere effort to plan their approach to interoperability through an all-inclusive approach. The Public Safety Communications Committee (PSCC) began discussing the future of interoperability communications for the state of Arizona with representatives of public safety agencies. In 2004, the state Legislature established the PSCC as a Commission and the Governor appointed commissioners. As of July 2007, many of the original commissioners remain on the committee. Additional appointees have established the Commission's broad range of representation, from jurisdictions, geography, and public safety disciplines across the state. The Commission has met regularly since early 2001, with meetings attended by all levels of government, including state, county, city, district, tribal, and federal.

The PSCC has sponsored or participated in several consultant studies to help define its interoperable communications requirements. The studies have included a needs assessment study, an interoperability gap study (by the Division of Emergency Management), and an ongoing system design and implementation project. The latter project has brought on Federal Engineering (*FE*) as the consultant. Moreover, the last six years, the PSCC's requirements and future direction have been derived from a sound basis of public safety operational needs and the philosophy established early on by the Commission in its *Concept of Operations* document published in October 2005. (The *Concept of Operations* document may be reviewed at <http://www.azdps.gov/pssc/PSCCFinalConOps102605.pdf>.)

In August 2007, the PSCC retained Federal Engineering to complete the Statewide Communications Interoperability Plan, with this document as the final deliverable. *FE* gathered most of the information contained herein through meetings, interviews, and document review. These documents and interviews represent all agencies operating in the state and further consider all public safety disciplines and all levels of government.

Cross-jurisdictional and cross-discipline participation have been achieved in several ways. First, representatives have attended PSCC meetings from state, county, city, district, tribal, and federal agencies. In addition, the consultant studies have interviewed practitioners at all levels of government. In addition, the AIRS plan includes all public safety disciplines.





4.0 CURRENT STATEWIDE ASSESSMENT

The January 22, 2007 *Current Radio Systems Report* prepared by Federal Engineering reviews all of the current radio systems in Arizona. The following excerpt from that report summarizes the existing radio systems configurations in the state:

The Arizona Public Safety Communications Commission (PSCC) is charged with bringing the radio systems of the state into a modern, easy to use network that provides interoperability among all agencies. Federal Engineering, Inc. (**FE**) was selected to provide the necessary communications engineering services for the new statewide land mobile communications system.

As a starting point, the PSCC and **FE** conducted a review of the existing, large regional and statewide radio systems within the state. This *Current Radio Systems Report* is the first deliverable report of the project. It will serve as a reference document for future tasks in the project. [Please see section 2 of this plan to view tables that show the following information.]

This report contains three sections. The first section describes the radio systems in operation for and by the state government. This section provides a brief summary of each system, the frequencies used, the general configuration of the infrastructure, an estimate of the number of subscriber units (mobile and portable radios), and how these units are distributed throughout the state. The agencies and systems reviewed are the following:

- Arizona Department of Transportation
- Arizona Department of Public Safety (DPS)
- Arizona Fish and Game Department
- Arizona Department of Corrections
- Arizona Department of Juvenile Corrections
- Arizona State Parks Board and State Land Department
- Arizona Department of Agriculture
- Emergency Medical Communications System
- Veterans Memorial Coliseum
- Shared Arizona Government Operations
- Arizona Interagency Radio System (AIRS)



These state systems operate mostly in the VHF radio band, with some at UHF and 800 MHz. There are over 17,000 subscriber units within the state agencies.

The next section of the report describes eight major systems in service in the state that are used by several municipal agencies and private sector firms. These descriptions resulted from a series of meetings where representatives from these organizations met with **FE** and the PSCC staff to discuss the systems. The systems included in this section are as follows:

- City of Glendale
 - Phoenix-Mesa Regional System
 - Pima County Integrated Wireless Network
 - Central Arizona Project
 - Salt River Project
 - Arizona Public Service
 - Northern Arizona University and the City of Flagstaff
 - Maricopa County
- (Yuma also operates an 800 MHz system.)

It was found that all of these major systems operate in the 800-900 MHz band and use various forms of trunking. Most are not directly compatible with the others. These agencies have a total of 35,000 radio units.

The last major section of the report provides a tabular listing of all radio system agencies in the state, indicating which frequency bands are in use. This section reports on County Sheriffs, Cities, Fire Districts, and Tribal agencies and was tabulated in previous reports.

It is estimated of all the subscriber units in the state, half are 800-900 MHz units, with the remainder divided evenly between the UHF/VHF conventional radios used by state agencies and the UHF/VHF conventional radios operated by local municipalities. (Please see

DRAFT – August 30, 2007

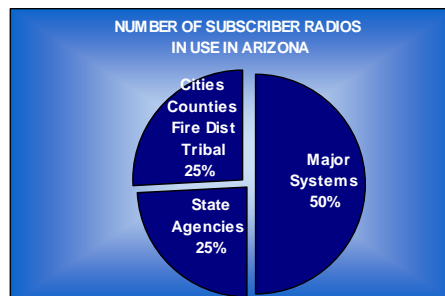


Figure 10 below.) This review is an important step in

Figure 10- subscriber radios in Arizona

the design of a new system.

The architectures as well as the strengths and weaknesses of the systems with which the statewide system will need to have interoperability with, or may replace, must be understood.

PSCC's second report, the February 19, 2007 *Radio System Needs Assessment Report* reviews problems, needs, and requirements found in previous studies and reports. The following excerpt from that report grouped the needs into four categories:

- Functional – The system or its components must operate or perform generally as described:
 - interoperability
 - voice encryption
 - dispatch centers
 - maintenance
 - operations
 - subscriber unit tiers
 - features
 - compatibility
- Technical – These engineering goals must be fulfilled by the system, such as:
 - coverage
 - capacity
 - reliability
 - quality of service
 - mobile data
 - interference levels
- Governance – The system is managed through some form of governance, which includes policies and procedures.
 - dispatch center autonomy and capabilities
 - system operating authority
 - funding
 - on-going system management



- Standards – The industry recognizes these as a general goal to be met. Examples are APCO Project 16 and 25.
 - The reports identified the Project 25 digital radio standard as a requirement to be compatible with future federal and local systems that are meeting Project 25 specifications.
 - Other industry standards were also identified with which the future system should be compatible.

The needs and requirements can be summarized by the following list:

- Statewide coverage
- Minimal interference potential
- Cost
- Channel Availability
- Complexity of use
- Encryption
- Interoperability within state agencies
- Interoperability with Metro agencies
- Interoperability with other agencies

4.0.1 LEVELS OF INTEROPERABILITY

Today, interoperability varies from agency to agency and from user to user. Most agencies, though, have AIRS (or its predecessor IARS) channels in their radios, meeting the “Shared Channels” level of the SAFECOM Interoperability Continuum. (See Figure 11 below to view the SAFECOM Interoperability Continuum.)



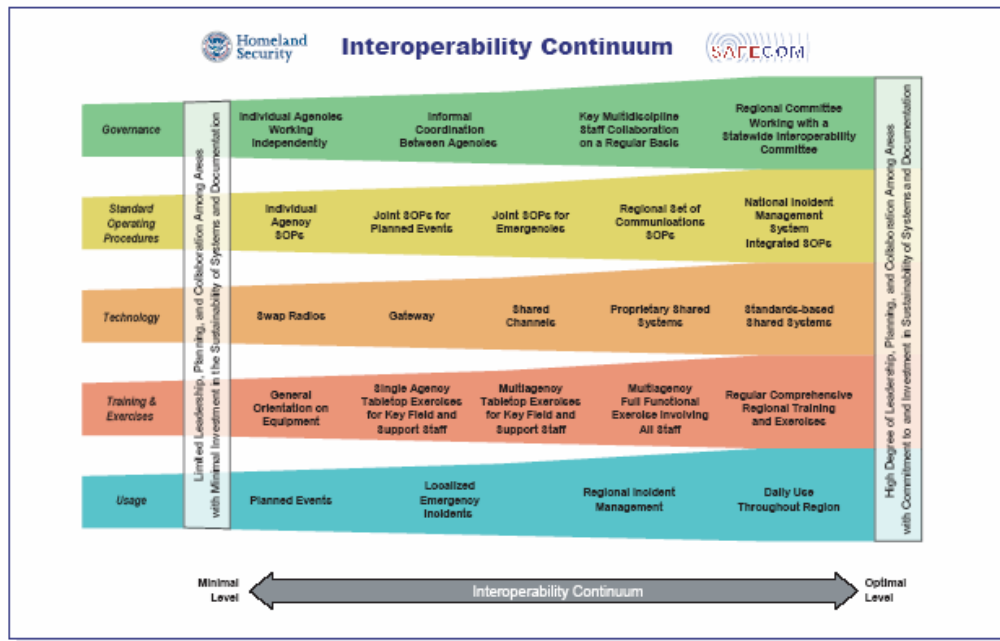


FIGURE 11- SAFECOM INTEROPERABILITY CONTINUUM⁷

Most counties in Arizona also have “gateway” units, either mobile or at dispatch or Emergency Operation Centers (EOCs), meeting the “Gateway” interoperability definition. Fire services and law enforcement agencies have caches of radios to exchange during special operations, large wildfires, or task forces, meeting the “Swap Radios” SAFECOM Continuum interoperability level.

In the Phoenix-Mesa metropolitan area and in Yuma County, 800 MHz Project 25 systems provide “Standards-based Shared Systems”-level interoperability. Pima County is moving to a standards-based shared system as well.

Yavapai County has shared dispatch for all police and fire agencies, meeting the “Gateway” interoperability level. Yavapai County’s goal is to provide a “Standards-based Shared System” for every agency wishing to participate in its new system, with “Gateway” and “Shared Channels” levels provided as alternatives.

The state of Arizona is currently interoperable with most other jurisdictions, using the AIRS suite of interoperability channels. This provides a rudimentary level of interoperability, as it allows only one talk path for emergency operations in any

⁷ <http://www.safecomprogram.gov/SAFECOM/Tools/Continuum/continuum.htm>



area of the state. AIRS requires dispatcher control to activate the stations. According to the SAFECOM Interoperability Continuum, this level of interoperability is considered “shared channels” however; this is limited to only one channel per region. Arizona is looking towards the future, creating a fully interoperable 700 MHz standards-based Project 25 radio system, that will enable all emergency responders to communicate with each other when their mission requires and in real-time, without the interaction of a dispatcher. Once the statewide 700 MHz system is deployed, the interoperability level will become the “standards-based, shared systems” as defined in the continuum.

4.0.2 DEVELOPING TECHNOLOGY

To remedy existing interoperability shortfalls, the following key strategies were adopted:

AIRS deployment—The state has been building out the Arizona Interagency Radio System (AIRS) radio network, based on the Inter-Agency Radio System (IARS). Originally planned and built in the early 1980s, IARS served the law enforcement community by providing VHF and UHF base stations at key locations. These stations could be linked together to allow VHF users to communicate with UHF users. As the system developed, some sites were also equipped with 800 MHz repeaters. 17 sites were in operation in 2005, as shown in Table 15 below:

The IARS concept was modernized and expanded using Department of Homeland Security (DHS) funds in 2006 and 2007. The upgraded system became AIRS. Where IARS had only VHF and UHF stations at each of the above sites AIRS uses base station “suites” composed of one wideband VHF, one narrowband VHF, one UHF, and one 800 MHz base stations/ repeaters. Like AIRS, each radio is connected to a dispatch center via a microwave system.

The original IARS implementation had each radio controlled separately by the dispatch center. AIRS was being implemented before the state microwave system upgrade was complete, and there was not enough microwave channel capacity to control each of the four radios in all the suites individually. Therefore, most of the sites are currently wired to connect the wideband VHF, the UHF, and the 800 MHz radios together, so that what is received by one station is retransmitted by the other stations. This “cross-band repeater” configuration requires only one control channel per suite (or per site) to control it from dispatch.

There were approximately 40 sites selected for AIRS implementation. Of these 40 sites, 21 are installed and operational, and seven are in progress of being installed and made operational. Another 13 are warehoused by the state and



will be installed as funding becomes available. An additional four suites are needed for four other sites, when funds become available to purchase them. The AIRS system requires not only additional funds for installing the additional suites, but the state microwave system requires upgrading and receiver voter, antenna combining, and console control equipment are required to make it fully operational as designed



COUNTY	SITE	MONITORED BY	COMMENTS
Apache	Greens	Navajo S.O.	
Cochise	Mule Mtn	Cochise S.O.	backup at Tucson DPS
Coconino	Mt. Elden	Coconino S.O.	
	Bill Williams Mtn	Coconino S.O.	
Gila	none		
Graham	Heliograph Peak		backup at U of AZ P.D.
Greenlee	Guthrie Peak		backup at Tucson DPS
La Paz	none		
Maricopa	South Mountain	Maricopa S.O.	part of MCSO system
	White Tanks Mtn	Maricopa S.O.	part of MCSO system
	Thompson Peak	Maricopa S.O.	part of MCSO system
	Towers Mtn	Maricopa S.O.	part of MCSO system
Mohave	Hualapai Mtn	Mohave S.O.	
Navajo	Greens Peak	Navajo S.O.	
Pima	none		
Pinal	none		
Santa Cruz	Nogales Hill	Santa Cruz S.O.	backup at Tucson DPS
Yavapai	Towers Mtn	Maricopa S.O.	part of MCSO system
Yuma	Telegraph Pass	Yuma S.O.	
	Oatman Mtn.	Yuma S.O.	
Childs Mtn.	Yuma S.O.		

TABLE 15- IARS RADIO SITES IN 1995⁸

The currently installed interoperability suites are located as follows in Table 16.

MOHAVE COUNTY	SANTA CRUZ	PIMA	MARICOPA
Christmas Tree	Nogales Hill	Mt Lemmon	White Tanks Mountain
Willow Beach	YAVAPAI	Keystone	South Mountain
Hualapi Mountain	Mingus Mountain	YUMA	Towers
Lake Havasu City	Juniper	Childs Mountain	Thompson
COCONINO COUNTY	Squaw Peak	Oatman Mountain	GILA AND PINAL
Navajo Mountain	GRAHAM / GREENLEE / COCHISE	Telegraph Pass	Signal Peak
Bill Williams	Guthrie Peak		NAVAJO AND APACHE



Mt Elden	Heliograph Peak		Piney Hill
Schnebly Hill	Mule Mountain		Greens Peak
			Holbrook

TABLE 16 - AIRS SUITES⁹

The radio coverage provided by AIRS is shown in the following maps (Figures 12 and 13). The first and third maps show the current coverage from the 28 sites in service on VHF and 700/800 MHz. The second and fourth maps show what is to be expected if 13 sites are added in key areas on the two radio bands (Figures 14 and 15).

⁹ Table from the 1999 version of the IARS State Plan



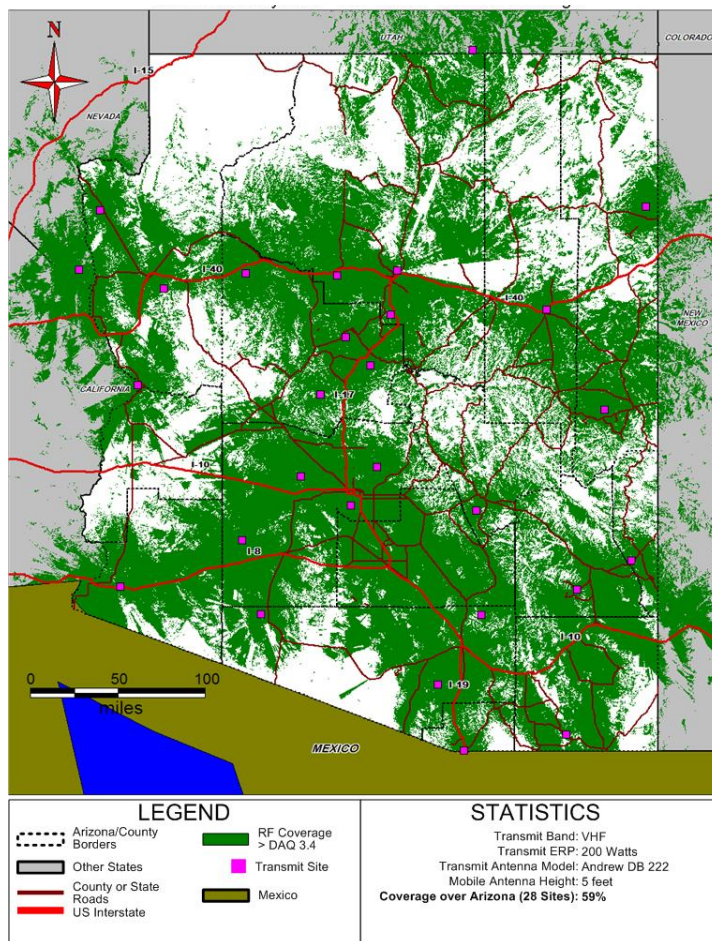


FIGURE 12- CURRENT AIRS SYSTEM - VHF MOBILE TALK-OUT COVERAGE



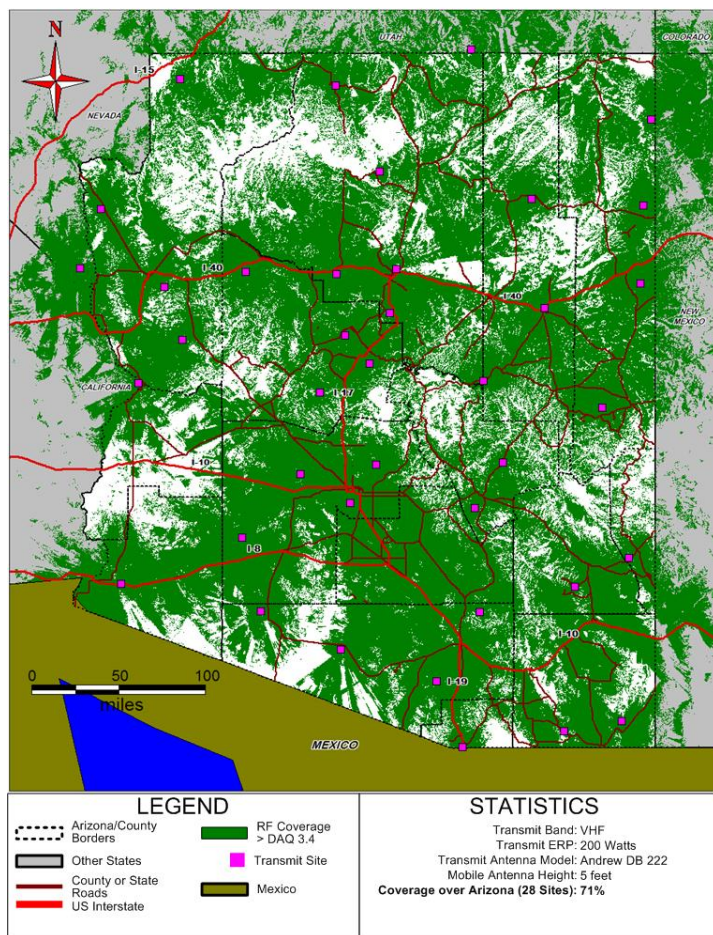


FIGURE 13- FUTURE AIRS SYSTEM VHF MOBILE TALK-OUT COVERAGE



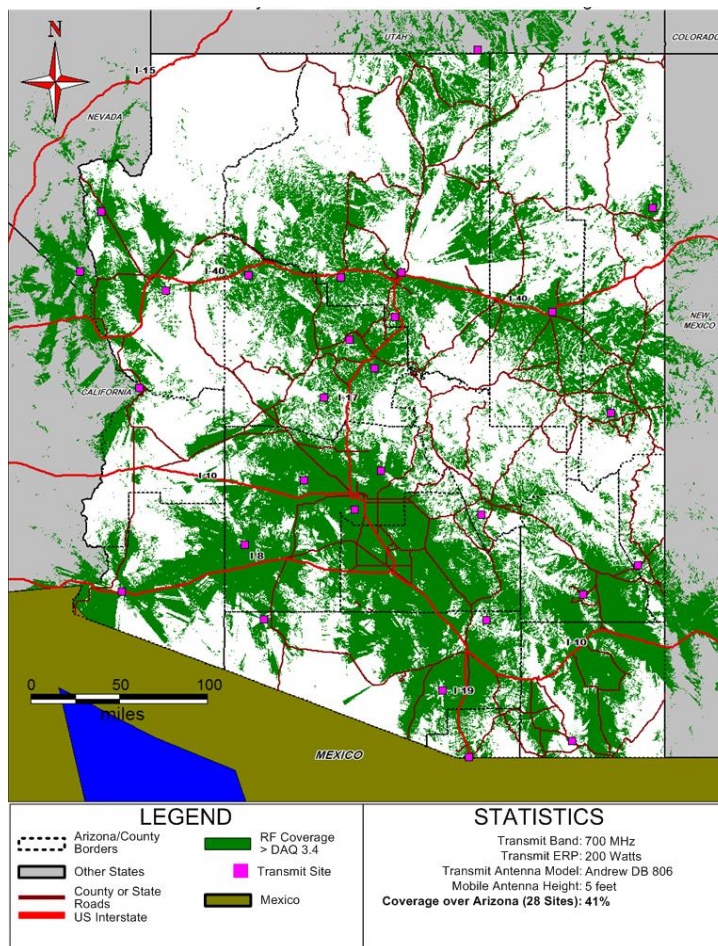


FIGURE 14- CURRENT AIRS SYSTEM 800 MHZ MOBILE TALK-OUT COVERAGE



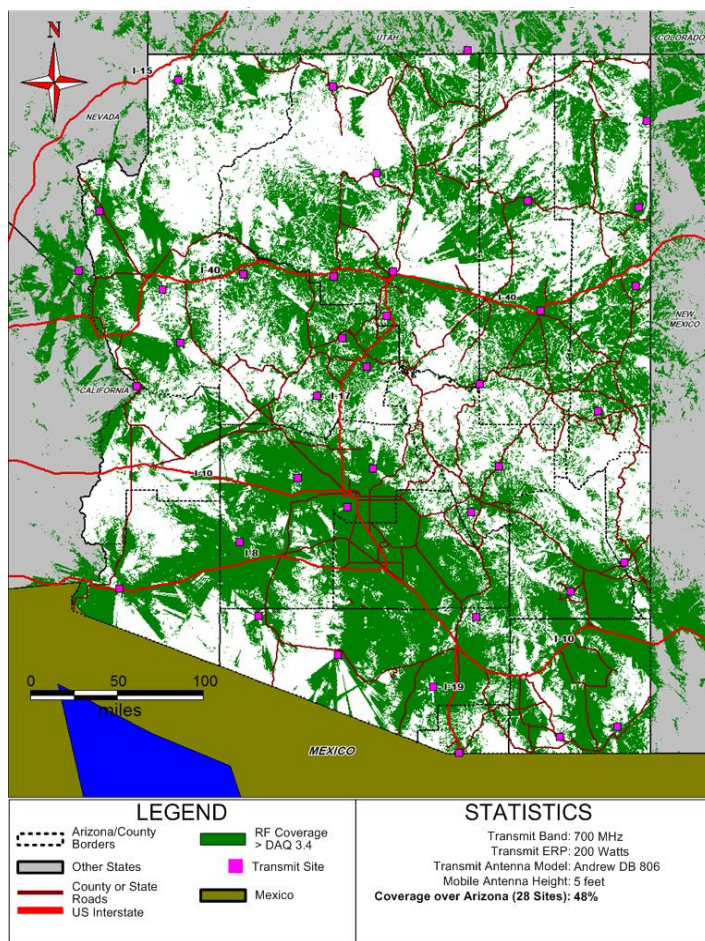


FIGURE 15- FUTURE AIRS SYSTEM 800 MHZ MOBILE TALK-OUT COVERAGE

The PSCC and SIEC have issued standards and plans outlining how the AIRS channels should be placed into agency radio units. The standards also recommend the features and capabilities for all future radio purchases. (The *AIRS Plan* is included in the appendix and can be found at <http://www.azdps.gov/pssc/documents/AIRSPolicy.2.2.07.pdf>.)

Frequency Agile Gateways— Most, if not all, of the counties have radio gateway units. A gateway, also known as a matrix switch, allows a radio on one channel to be connected to a radio on another channel, effectively “patching” the communications of the two channels together. The units (including the switch and the radios) supplied by the state were mounted in mobile vans or installed at fixed locations.



State Microwave System Upgrade— The state's current microwave network has been developed over the last fifty years to interconnect radio sites located across Arizona with dispatch centers and other facilities. The current system is composed of 84 paths, each connecting two locations. These links range in length from a few miles to over 130 miles, with an average of about 42 miles. In total, the links add up to 3562 miles, or the distance from Washington, D.C. to Phoenix and back.

The microwave network is used mostly to control radio base stations at remote communications sites as described above and may be used to carry computer data and telephone signals. The state of Arizona microwave network connects 57 remote sites with 19 facilities.

Although built primarily to support the Arizona Department of Public Safety radio system, many agencies use some portion of its capacity. Some of these agencies are listed in Table 17 below:

AZ HIGHWAY PATROL	DEPT OF AGRICULTURE	GOVERNOR'S SECURITY
ADOT Maintenance	NOAA/Weather Service	ADOT Construction
AZ Game & Fish	State Land & Forestry	State Parks
Dept of Corrections	Capitol Security	Army National Guard
Dept of Emergency Management	Drug Enforcement Agency	ADOT Motor Vehicles Division
Federal Bureau of Investigation	Every County in Arizona	Bureau of Land Management
Yavapai Fire District	US Coast Guard	Sedona Fire District
US Army Proving Ground	DPS Criminal Investigations	AZ EMS Communications

TABLE 17- STATE AGENCIES USING MICROWAVE BACKBONE

Currently, about 13 microwave links have been upgraded to digital paths, connecting approximately 19 sites and facilities.

The state has prepared the following map (Figure 16) showing the existing microwave system. A more detailed and clearer designed map is available to authorized personal by contacting the Arizona Department of Public Safety, Wireless Systems Bureau, Phoenix, Arizona.



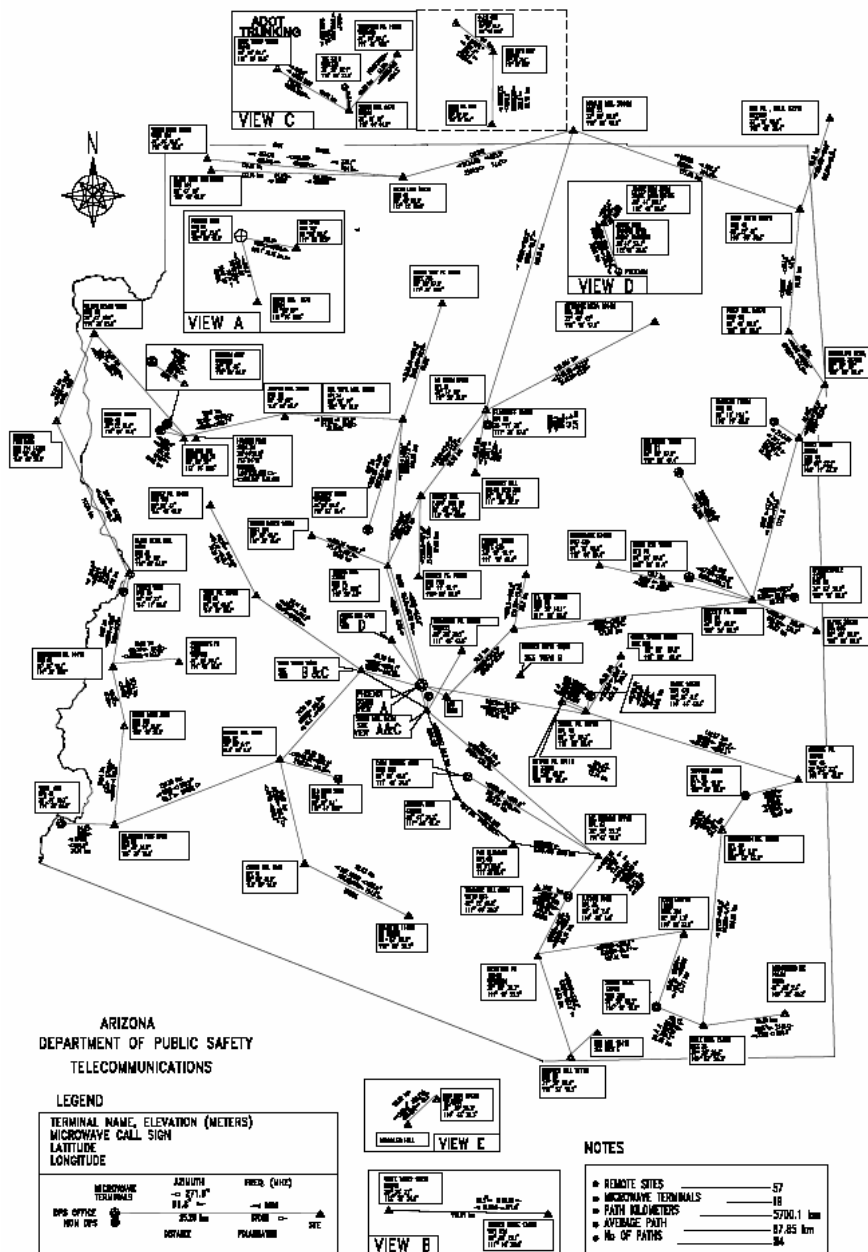


FIGURE 16- STATE MICROWAVE MAP¹⁰

¹⁰ Arizona Department of Public Safety, Wireless Systems Bureau



Statewide Land Mobile Radio System—because of the various consultant studies, the PSCC has decided to install a statewide radio system to serve all public safety entities. The design calls for a 700 MHz system employing APCO Project 25 digital technology. The system will reuse the 96 channels available for state use and will have 74 radio sites providing mobile coverage throughout the state. Most of the sites are owned by the state, with some added contingency sites. The sites will be interconnected by the state microwave system, which must be upgraded to digital for it to have the necessary features and capacity.

The sites will have a number of repeaters based on the amount of radio traffic and number of users expected in the area of the site. A minimum of six channels and a maximum of 18 channels will be installed at each site.

The statewide system will be interconnected with existing or new local 800 MHz Project 25 systems. The Project 25 Inter-Sub-System Interface (ISSI), is currently under development, and will be used to permit seamless roaming between the state and local systems.

All subscriber units (mobile and portable radios) will be capable of 700 and 800 MHz operation, allowing them to roam among systems in both bands.

This system will provide robust interoperability among participating agencies. By using a common infrastructure, each user will be able to communicate with any other user.

The following map (Figure 17) shows the predicted radio coverage provided by the 700 MHz radio system.



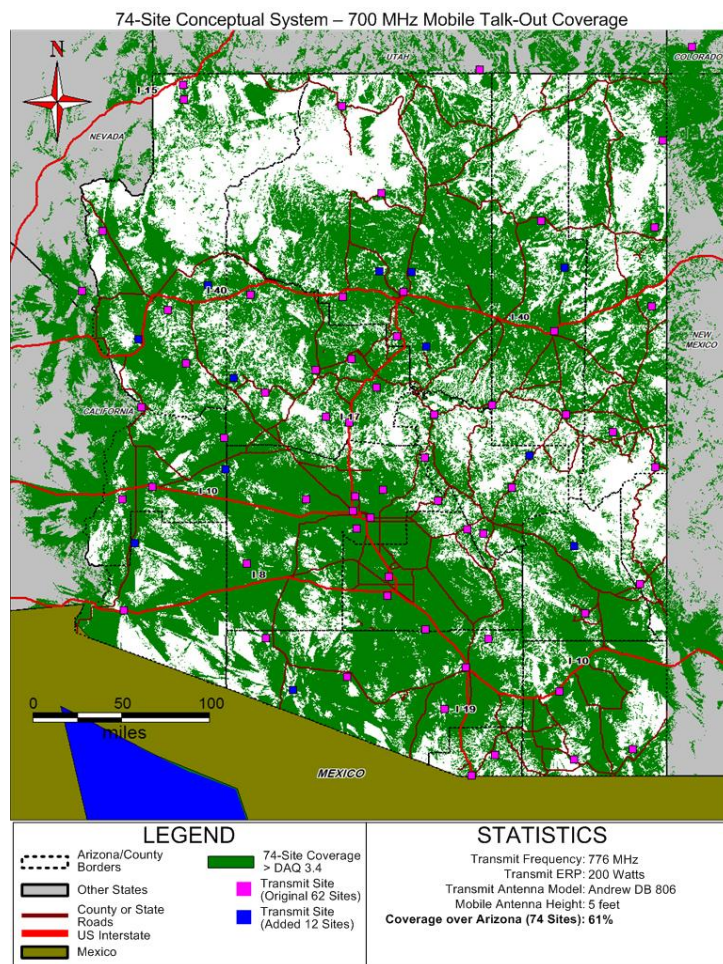


FIGURE 17- 74 SITE CONCEPTUAL SYSTEM 700 MHZ TALK-OUT COVERAGE

Regional System Enhancement— The state encourages local and tribal government agencies to upgrade their radio systems so they are compatible with state systems. All agencies will also be encouraged to participate in the statewide 700 MHz system. The state realizes that the 700 MHz system may not meet the needs of all counties and cities. For example, the statewide system, being designed to support the traffic and quantity of users from state agencies for mobile coverage, may not provide enough capacity for local government needs, or may not provide adequate indoor portable coverage as required by a city agency. However, the system's governance will provide methods to



enable the local agency to provide additional sites and/or channels where needed to meet their needs. The local agency will benefit from complete interoperability and statewide mobile roaming.

Some non-state agencies may not desire to move to 700/800 MHz, but rather keep operating on their existing system. The statewide system will be expandable to permit either console patching or permanent interconnection with the local system. It is envisioned that the local agency could use one of its existing channels to interface with a 700 MHz talk-group. Then 700 MHz system users and local users would meet on this channel/talk-group to communicate. For this to succeed, of course, the local agency must provide local coverage where needed, and if local units leaves their coverage area, this interconnection will no longer provide the communications connectivity.

All agencies will continue to be encouraged to equip their personnel with AIRS channels, further providing interoperability. Local agencies could also purchase 700 MHz Project 25 mobile or control station radios to allow those mobile users or dispatch centers so equipped to communicate directly with statewide system users.

Demonstration Project— The state has proposed to show the interoperable nature of the future system. Methods to expand current systems for greater coverage will show how government entities can work together and form governance agreements. The demonstration project will also show how completely separate radio systems can be interconnected to permit continuous radio coverage over large portions of the state. The demonstration project will include four components:

1. Provide state personnel radios to be used on the Phoenix-Mesa metro 800 MHz system, demonstrating the interoperable nature of Project 25 systems and validating forms of inter-governmental agreements.
2. Building a 700 MHz site on White Tank Mountain to expand the Phoenix-Mesa 800 MHz system coverage west of the metro area and demonstrating the coexistence of 700 and 800 MHz stations in the same system. Governance issues will also be identified as inter-governmental agreements are formed.
3. Build a 700 MHz site on Oatman Mountain to expand eastward the coverage of the Yuma Regional Communications System (YRCS) 800 MHz network. This will demonstrate 700 MHz in wide-open desert terrain and the coexistence of 700 and 800 MHz systems, and identify governance issues.



4. Connecting the Phoenix and Yuma systems together to test roaming and intersystem communications, as well as additional governance and system management issues

4.1 GOVERNANCE STRUCTURE

The Public Safety Communications Commission (PSCC) was formed to address interoperability issues in the state of Arizona and begin the process of identifying a strategy, proposed solution and the funding needed to achieve statewide interoperability. In 2005, Governor Janet Napolitano signed legislation to establish the Arizona Public Safety Communications Commission (PSCC). With Commission members appointed by the Governor, the PSCC reflects a broad, multi-disciplinary representation of public safety and emergency management agencies from across the state. The PSCC is charged with oversight of the statewide plan for an interoperable radio and data network. (Figure 18 is the Organizational Chart for the PSCC.)

The Commission has always recognized and stressed the importance of shared joint use radio systems not only for cost control, but most importantly for improved interagency communications known as "interoperability." The PSCC Support Office is working to develop and implement/facilitate the Intergovernmental Agreements (IGA) necessary to improve interoperability through co-development and sharing of future and existing systems. By expanding upon existing and developing new partnerships and associated IGA's, Arizona plans to capitalize on and complement existing and future systems which are closely related to the PSCC's defined path of a 700/800 MHz trunked environment based on the APCO Project 25 standards. The Commission has also made a strong commitment to interagency communication with existing VHF & UHF systems first through the AIRS network of mutual aid channels but also through high-level network connections



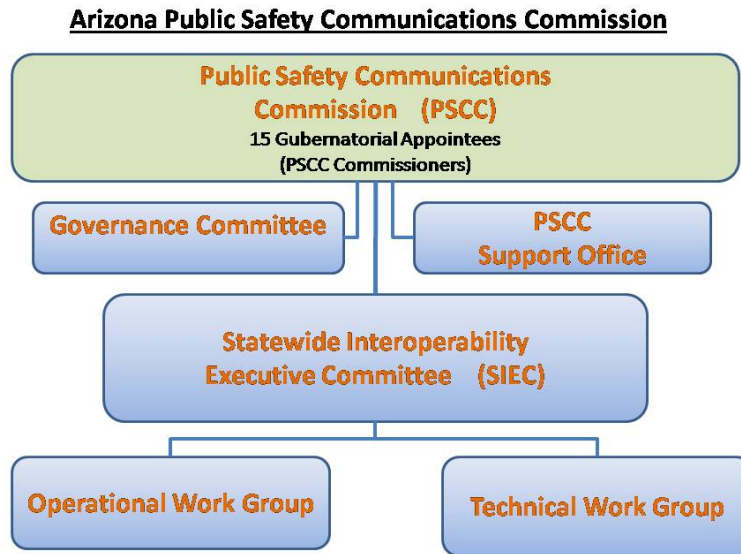


FIGURE 18 - ORGANIZATION CHART ARIZONA PUBLIC SAFETY COMMUNICATIONS COMMISSION

state government is in an ideal position to provide leadership and facilitation to ensure that radio systems are created around a central plan that encompasses cooperation and involves all levels of government. Education to garner support for this approach is essential and must be presented in a non-technical format for elected officials and members of the public. The PSCC *ConOps* was a document developed and approved by the PSCC in part to fulfill this function. (The *ConOps* Report may be accessed online at:

<http://www.azdps.gov/pscc/PSCCFinalConOps102605.pdf>

Funding limitations restrict most agencies' abilities to create state of the art radio systems. As part of their oversight, the Arizona PSCC must find a compromise that is palatable to the majority of prospective members. In addition, the PSCC must collaborate with large metropolitan areas, Tucson/Pima County, Phoenix/Mesa, as well as with smaller jurisdictions to strategize how the regional projects in these areas can be incorporated into the statewide plan.

A common theme among the more mature projects is that governance is an evolving process. The current Arizona PSCC provides a good starting place for governance. State government is motivated by the pressing need to replace its aging system. Smaller agencies or those serving rural communities are motivated to participate in the development of a new system because smaller

Comment [DBH14]: ICTAP - The state has a series of fairly large reports. Many are available via a URL, some are not. To include them as appendices will make this PSIC hundreds of pages long. Is it OK just to link to Websites, or to POCs?



agencies lack the resources to build the larger communications networks. The agencies in regional interoperability projects are motivated to achieve interoperability with partner agencies due to operational realities. These same realities create the will to achieve interoperability with developments at the state level. It is essential that potential partner agencies participate in the development of governance and decision making processes to ensure that a cohesive and united effort will be successful and maintained.

4.1.1 PUBLIC SAFETY COMMUNICATIONS COMMISSION (PSCC)

Vision

The Vision of the Public Safety Communications Commission is to

“Enable real-time, interoperable communications between local, county, state, tribal, and federal public safety entities in the state of Arizona to effectively protect lives and property.¹¹”

Mission

In order to enable real-time, interoperable communications between local, county, state, tribal, and federal public safety entities in the state of Arizona to protect lives and property, the PSCC will:

- o promote the development and use of standards-based systems.
- o capitalize on opportunities to share resources
- o apply best practices and lessons learned

¹¹ Public Safety Communications Commission



- o provide effective, sustainable, and reliable radio communications between local, county, state, tribal, and federal public safety entities

History of the PSCC

The Arizona Public Safety Communications Committee (PSCC) originated as an *ad-hoc* committee comprised of dedicated public safety executives who volunteered their time and energy to addressing the short and long-term interoperable communications needs for all public safety entities in the state of Arizona. The PSCC was formed in April of 2000 to educate its members and community stakeholders on the critical need for interoperability and to begin the process of identifying funding for this long-term enterprise. The PSCC membership has shared one central focus: *to develop a standards-based, shared voice and data radio system that efficiently and effectively addresses the front-line needs of its users to protect life and property.*

The PSCC started meeting on a quarterly basis and established subcommittees to assist in identifying funding and educating the public safety community, general public and elected officials. With the assistance of the Arizona Criminal Justice Commission (ACJC), a federal appropriation earmark was acquired to fund a study of public safety communications systems in use throughout Arizona. This study was the critical first step required before we (PSCC) could begin the development of a conceptual and detailed technical design that would set the course for future public safety communication systems in Arizona.

Since September 11, 2001, the national and state focus on homeland security has further emphasized the critical need for radio voice and data technologies to support the public safety “first responders” into the foreseeable future. Current homeland security funding is only a stopgap measure to improve local interoperability and does not improve upon existing communication infrastructures or lack of statewide radio coverage.



While all public safety agencies have a need to upgrade communication capabilities to service their specific communities, it became clear a greater statewide effort was necessary to address multiple-agency/cross-jurisdictional communications needed during large-scale events and natural disasters affecting the state. This has evolved into a vision for a modern statewide voice and mobile-data network, which will support local public safety operations as well as providing a robust statewide infrastructure supporting wide-area coverage for all agencies. This is a long-term, complex and expensive undertaking that requires a high level of accountability, management and operational control to be successful. Planning and management of a system of this size and complexity requires a competent full-time staff with a single focus toward a statewide system design and implementation.

Today's statewide microwave network and associated state agency radio systems are managed by engineers and technicians employed by the Department of Public Safety (DPS). The state-owned microwave network, which could serve as the statewide infrastructure, is badly in need of modernization, which includes transitioning from analog to digital technology. The four to five decade old technologies and infrastructures of concrete and steel in Arizona have survived well beyond their anticipated life cycle and are in desperate need of replacement and modernization. DPS staffing and current funding are inadequate for the proper planning, development, deployment and operational management of any future network that becomes a part of the state's public safety infrastructure. Further, this issue transcends the needs and sole use by state agencies and affects all public safety entities working within the state.

Now officially organized as the Arizona Public Safety Communications Advisory Commission (continuing to be known as PSCC), the commission will build upon the work already begun. The PSCC staff will foster, recommend and develop technical standards; oversee conceptual and detailed design efforts; and pursue funding to build out and maintain a statewide system for use by all local, state, tribal and federal public safety entities in Arizona.



The PSCC will continue to work closely with local, county, state, tribal and federal partners to insure a system design that will meet the needs of all parties. There is much more to be done, and the acquisition of ongoing funding to complete designs and construct the system is critical to enable and advance the work already accomplished.¹²

Membership of the PSCC

The Governor of the state of Arizona appoints 15 members to serve as Commissioners on the PSCC. The terms of these appointments are for 3 years. The Arizona State Senate must confirm each member representing differing disciplines and jurisdictions. Terms of office are offset to ensure a consistent approach in this important role. Currently, the following Commissioners serve the PSCC.

1. Chairman – David Felix, Deputy Director, Arizona Department of Public Safety
2. Ray W. Allen, Assistant Chief, Tucson Fire Department
3. Marcus Aurelius, Emergency Management Coordinator, City of Phoenix
4. Amy, Brooks, Captain, Apache Junction Fire Department
5. Hal Collett, Sheriff, La Paz County / Sheriffs' Association
6. Mike Brashier, City of Casa Grande
7. Jan Hauk, President, Arizona Fire District Association / Buckeye Valley Fire District
8. Richard Miranda, Chief, Tucson Police Department
9. Tracy L. Montgomery, Assistant Chief, Phoenix Police Department
10. Leesa Berens Morrison, Director, Arizona Department of Homeland Security
11. Dora Schriro, Director, Arizona Department of Corrections
12. Danny Sharp, Chief, Oro Valley Police Department
13. Dan Wills, Battalion Chief, Sedona Fire District
14. Dewayne Woodie, Fire Chief, Ganado Fire District
15. Michael Worrell, Captain, Phoenix Fire Department

The PSCC was organized in 2000 and has conducted regular meetings since its inception. Meeting intensity has increased in recent years as illustrated by the PSCC meeting calendar below.

¹² The information on the PSCC was taken from <http://www.azdps.gov/pssc/default.asp>



2000 – Organized

2001 – October 30; December 06

2002 – January 22; March 26; August 27

2003 – February 25; March 25; June 24; September 23; December 16

2004 – March 23; June 29; October 26

2005- January 11; March 22; May 24; July 26; October 26

2006 – January 24; April 25; July 11; October 24

2007 – January 23; April 24; July 10; August 21; September 25; October 23;
November 13; December 11

Day-to day operations of the PSCC

The Arizona Public Safety Communications Support Office, that includes the Executive Director of the PSCC, is responsible for executing and maintaining the Arizona Interagency Radio System (AIRS) State Plan, Channel Plans, and Memorandum of Understanding (MOU). Completing the MOU allows agencies to participate in the AIRS for mutual aid operations by accessing state-licensed mutual aid frequencies.

The MOU is a simple two-page agreement (plus a signatory page) that contains the purpose, the authority, the applicability, and the understanding of the agreement. It requires an authorized signature of the User Agency and the signature of the PSCC Executive Director. Additionally, it requires the user agency to disclose the numbers of subscriber units and the channels on which those units will function. (The online form and MOU is available at the following Website: <http://www.azdps.gov/psccl/survey.asp>).

Governance structure for interoperability

Arizona has a multi-level program to oversee the governance of interoperable communications. The highest levels of state government recognize the criticality of public safety communications and as such, the Governor and legislature have legally empowered the Public Safety Communications Commission (PSCC) to oversee the state's efforts. To support the work of the PSCC, the state has provided staff, managerial and logistical support through the PSCC Support Office and its Executive Director. Reporting to the PSCC is the



Statewide Interoperability Executive Committee and its sub-committees. The Commission and Committee are composed of appointed representatives of all levels of government and emergency response providers. As the state is currently planning a complete upgrade of their existing emergency communications networks, these bodies will fill the crucial role of insuring user participation with government oversight as the governing bodies, standard operating procedures and agreements continue to be identified and formalized. Although the members will change on a regular basis, these bodies do not have expiration dates or sunshine clauses.

Charter

The charter of the PSCC was established in Arizona State Law on July 5, 2004. It is codified under Arizona law 41-1820.41 and 41.1830.42. The rules under which the PSCC exist and operate are below in Figure 19.

41-1830.41. Arizona public safety communications advisory commission: membership; appointment; terms; meetings

- A. An Arizona public safety communications advisory commission is established in the department of public safety consisting of the director of the department or the director's designee and fourteen other advisory members appointed by the governor pursuant to section 38-211.
- B. The governor shall make the appointments so that the existing five emergency response regions in this state are as equally represented on the advisory commission as possible.
- C. Members shall serve three year terms.
- D. The Arizona public safety communications advisory commission shall meet quarterly or on call of the director who shall serve as chairman.
- E. Commission members are eligible for reimbursement of expenses pursuant to title 38, chapter 4, article 2.

41-1830.42. Advisory commission: department; powers and duties; report

- A. The Arizona public safety communications advisory commission shall make recommendations to the department regarding the development and maintenance of work plans to outline areas of work to be performed and appropriate schedules for at least the following:
 - 1. The development of a standard based system that provides interoperability of public safety agencies' communications statewide.
 - 2. The promotion of the development and use of standard based systems.
 - 3. The identification of priorities and essential tasks determined by the advisory commission.
 - 4. The development of a timeline for project activities.
 - 5. Completion of a survey of existing and planned efforts statewide and benchmark against similar efforts nationally.
 - 6. Providing support for the state interoperability executive committee.
 - 7. Establishing committees and work groups as necessary.
- B. The department may:
 - 1. Employ personnel as required with available monies.
 - 2. Enter into contracts to assess, design, construct and use public safety communications



systems.

3. Accept grants, fees and other monies for use by the department and the advisory commission.
4. Enter into agreements to carry out the purposes of this article.
5. Request cooperation from any state agency for the purposes of this article.

C. The department of public safety shall consult with the director of the government information technology agency or the director's designee on an ongoing basis and submit a report quarterly to the director and the joint legislative budget committee for review regarding expenditures and progress of the department of public safety, including a review of staff operations and preparation of requests for proposals for system detail and concept work.

D. The commission shall annually submit a report of its activities and recommendations to the governor, the speaker of the house of representatives and the president of the senate on or before December 1 and shall provide a copy of the report to the secretary of state and the director of the Arizona state library, archives and public records.

FIGURE 19 - PSCC ENABLING LEGISLATION¹³

4.1.2 STATEWIDE INTEROPERABILITY EXECUTIVE COMMITTEE (SIEC)

The Arizona SIEC is a working group of the PSCC. The Arizona SIEC is also authorized by the state through the recommendation of the Federal Communications Commission. The SIEC has a voting body, a Technical Subcommittee and an Operational Subcommittee whose members are listed below. Although, the SIEC is a state level oversight body, they are also responsible for the coordination and the implementation of the 700 MHz frequency band. The SIEC has a Website available for public review at: <http://www.azdps.gov/psc/standards.asp>. Included on this Website are the programming and equipment standards for VHF and UHF equipment as well as other interoperable communications related documentation.

SIEC Members

- Co-Chair Paul Wilson, Captain Pima County Sheriff's Department
- Co-Chair Mark Ventui, Director, Guardian Medical Transport
- Ken Leighton-Boster, Emergency Response Chief, Arizona Department of Health Services

¹³ Arizona Legislature



- Scott Tillman, Supervising Telecommunications Engineer, Wireless Systems Bureau, Arizona Department of Public Safety
- Pete Weaver, Emergency Manager/LEPC Coordinator, Pinal County Public Works

Technical Working Chairs

- Co-Chair Kevin Rogers, Manager, Wireless Systems Bureau, Arizona Department of Public Safety
- Co-Chair Mike Worrell, Captain, Phoenix Fire Department

Operations Working Group Chairs

- Co-Chair Mike Brashier, Captain/PIO, Casa Grande Fire Department
- CO-Chair, Carl Hartmetz, Communications Director, La Paz County Sheriff's Department

The SIEC is a highly interactive working group that encourages participation from every aspect of the public safety and first responder community of interest. Through their participation and input, this Arizona SCIP will incorporate the needs and concerns of all levels of public safety providers. This will ensure system design success and additionally, as the standard operational guidelines and procedures are created, they will be acceptable and functional to all disciplines of users.

SIEC Meetings:

2005 - July 26, October 26

2006 – January 24, April 25, July 11

2007 – January 23, July 9-10, August 21, September 25, October 23, November 13, December 11

As illustrated by the membership of the PSCC and SIEC, the state has included local participation in the foundation of SCIP governance. Local entities will continue to be voting members of the governing bodies and participate in the strategy and planning sessions as the new networks are designed and constructed.

4.2 TECHNOLOGY



The current technology in place within the state is mostly conventional, VHF or UHF, serving the more rural areas. The metropolitan areas have migrated or are in the process of migrating to 800 MHz trunked systems.

For detailed information about existing systems, please refer to the January 22, 2007 *Current Radio Systems Report* prepared by Federal Engineering. The following are the summary sections from that report.

State agencies—There are 12 state operated radio systems.

Table 18 – State agency frequency band use, summarizes the frequency bands used by the state government agencies.

Table 19 – State agency equipment inventory, shows the total quantity of portable and mobile radios used on the state-operated radio systems.



STATE AGENCY FREQUENCY BANDS					
AGENCY	VHF	UHF	800	800	800
	CONV	CONV	CONV	TRUNK	P-25
Department of Transportation	X			X	
Department of Public Safety		X			
Game & Fish Department	X				
Department of Corrections	X				
Dept. of Juvenile Corrections	X				
Parks Board & State Land Dept.	X				
Department of Agriculture	X				
EMSCOM		X			
Wireless Systems Bureau		X			
Veterans Memorial Coliseum		X			
Shared Gov't Operations		X			
AZ Interagency Radio System	X	X	X		

TABLE 18 - STATE AGENCY FREQUENCY BAND USE

STATE AGENCY EQUIPMENT INVENTORY						
EQUIPMENT TYPE	HOMELAND SECURITY REGIONS					TOTAL QTY
	NORTH	SOUTH	EAST	WEST	CENTRAL	
DPS Mobile and Portable Radios UHF	350	550	340	310	1350	2900
ADOT Mobile and Portable Radios VHF	600	600	600	600	800	3200
ADOT Mobile and Portable Radios 800					800	800
DOC Mobile and Portable Radios	580	2457	2648	0	2317	8002
Game and Fish Mobile and Portable Radios	515	146	12	63	294	666
Parks Mobile and Portable Radios	12	18	12	16	2	60
State Land Mobile and Portable Radios	44	69	11	13	285	422
Agriculture Mobile and Portable Radios	8	4	3	2	11	18
EMSCOM Mobile and Portable Radios	210	340	300	250	100	1200
Operational Base/Repeater Stations	29	21	17	25	10	102
TOTAL MOBILE & PORTABLE Radios	1955	4184	3926	1254	5959	17278
Note: Quantities across and down may not add to equal totals as some units operate in multiple regions.						



TABLE 19 - STATE AGENCY EQUIPMENT INVENTORY

Major Radio Systems - There are 11 major radio systems serving non-state entities.

These major radio systems have 36,369 total subscriber units, including 400 VHF, 400 UHF, 1,500 in 900 MHz, and 34,069 in 800 MHz, distributed as shown below in Table 20 – Summary of major radio systems.

SUMMARY OF MAJOR RADIO SYSTEMS					
Major System Name	System Type & Features	Frequency Band	Channel Quantity	Radio Site Quantity	Subscriber Unit Quantity
Glendale	P25, simulcast, trunked	800	10	2	2000
Phoenix	P25, simulcast, trunked	800	112		11,000
Mesa	P25, simulcast, trunked	800	16	9	3500
Pima County	P25, simulcast, trunked (future)	800	130	26	6988
Central AZ Project	TDMA, trunked	800	8	15	475
Salt River Project	Trunked	900	25	5	1500
Salt River Project	Conventional	VHF			400
Salt River Project	Conventional	UHF			400
AZ Public Service	Trunked	800	39	32	3349
NAU/Flag-staff	Trunked	800	8	2	757
Maricopa County	Trunked	800		15	6000

TABLE 20 - SUMMARY OF MAJOR RADIO SYSTEMS

All Other Radio Systems—The radio systems serving entities other than reported above are summarized in the tables in Section 2.1.0.4 of this plan.

Summary of All Radio Systems—The frequency band and quantity of radios used in all of the radio systems serving entities in Arizona are shown in Table 21 – Radio frequencies used in Arizona.



SUMMARY OF RADIO BANDS USED BY AGENCIES IN ARIZONA					
ENTITY	VHF	UHF	800	800	800
	CONV	CONV	CONV	TRUNK	P-25
STATE AGENCIES	7	6	1	1	0
COUNTY SHERIFFS	12	1	0	2	0
CITIES	54	10	2	8	4
FIRE DISTRICTS	65	16	0	0	0
TRIBAL NATIONS	10	9	3	0	0
TOTALS	141	36	5	10	4

TABLE 21 - SUMMARY OF RADIO BANDS USED BY AGENCY IN ARIZONA

The results of the current systems study show there are a total of 141 VHF systems, 36 UHF systems, and 19 800 MHz systems in use. The current radio equipment used in the state is aging, and faces increasing difficulties in reliability. As this equipment gets older, it will also have increased maintenance costs, as well as not being able to address the upcoming federal narrowbanding mandates for 2013.

The 19 systems in the 800 MHz band serve some 35,000 units. A count of the conventional units was not performed during the study, but the state system units alone total about 16,500. There are another 17,000 conventional units on the VHF and UHF bands used by Sheriffs, Police, Fire, and other public safety agencies.

It is important to note that all of the non-800 MHz radios, including portables, mobiles, and base stations, need to be narrowbanded by 2013, which means many existing radios must be replaced with narrowband-capable units. Radios recently purchased may have narrowband capabilities, meeting the FCC rules. Agencies wishing to continue to use their existing/legacy systems that have been narrowbanded to meet the 2013 date may choose not to join the statewide 700 MHz system. The AIRS network will continue to serve these agencies. Further, their systems could be interfaced to the 700 MHz system for improved interoperability communications.

Those agencies not joining the 700 MHz system can join at any time in the future. Regardless, AIRS will be maintained as long as legacy system users and/or entities coming from other areas exist to permit interoperability among all public safety agencies.

There will always be the need for looking ahead to acquire new technology. This is true for both the narrowband legacy system and the 700 MHz system users.



The governance board and PSCC must establish and continuously review migration routes to allow users to upgrade to new technology. For example, although the 700 MHz system is currently planned to use 12.5 kHz digital bandwidth in 2013, it is known that 6.25 kHz bandwidth will be required in 2017, and engineering details are currently being explored to permit this technological change.

Even if new technology is not warranted for the foreseeable future, replacement strategy and funding must be planned by the governing board to replace portables, mobiles, base stations, controllers, and all system components as they reach their useful life.

Even today, agencies are encouraged to purchase radio equipment meeting the standards set forth by the SIEC regarding interoperability. These specifications are included in the appendix relating to AIRS operation.

While conducting this survey it was noted that the state desired to use Communication Assets and Survey Mapping CASM System to better inventory their equipment. Additionally, CASM would be offered to local governments to assist them and the state in inventory and interoperability solutions.

4.3 STANDARD OPERATING PROCEDURES

Recognizing that Standard Operating Procedures are the written instructions that organizations and individuals must follow to insure standardization of activities and or procedures, such as accessing interoperability channels, the PSCC has created a Governance Committee to insure all aspects of governance is successful and representative of all levels and disciplines of users. The SOPs, and this plan, are being created to memorialize thoughts, plans, and procedures related to public safety communications in the state of Arizona. As the interoperability functions and features of the present AIRS and future 700 MHz network will be accessible by state responders, federal responders and emergency service providers from all levels of Arizona, other states, and the federal government, it is imperative the procedures and terminology follow the nationally recognized program of the National Incident Management System. In addition to complying with NIMS, the very concepts of promoting interoperability on a statewide level, insuring recognized incident management practices and working towards improved domestic preparedness are the goals of the National Response Plan (NRP). Arizona is enhancing incident planning and response by enabling communications between the local, state and federal government's emergency responders as well as non-governmental



organizations, all towards the national goal of improving protection for our citizens and emergency responders.

Table 22 below is an outline of Standard Operating Procedures (SOPs) that are used in Arizona.



<i>SOP Name</i>	<i>Agencies Included</i>	<i>Disciplines Included</i>	<i>SOP Location*</i>	<i>NIMS-compliance</i>	<i>Frequency of Use</i>
<i>SOP Name:</i> AIRS <i>SOP Description</i>	Authorized Public Service Providers	Fire, EMS, Law Enforcement, Government,	Location: http://www.azdps.gov/pssc/standards.asp This SOP gives guidance for use of state interoperability channels.	Yes	Daily
<i>SOP Name:</i> Programming Guide <i>SOP Description</i>	Authorized Public Safety Providers	Fire, EMS, Law Enforcement, Government,	Location: http://www.azdps.gov/pssc/standards.asp This SOP identifies specific channels and frequencies for accessing the state interoperability network.	Yes	Daily
<i>Arizona Fire and Mutual Aid Plan</i>	All Fire Service	Fire Service	Location: http://azchiefs.publicaware.com/Assets/dept_1/PM/pdf/Mutual_Aid_Plan.pdf This document provides the procedures by which mutual aid is requested and coordinated for all fires in Arizona.	Yes	Daily

Comment [DBH15]: We intend to continue looking for additional SOPs to include with next draft



<i>SOP Name:</i> Arizona Field Operations Guide (AFOG) <i>SOP Description</i>	All Fire Service	Fire Service	Location: ?? This document provides detailed guidelines and procedures for command staff and firefighters operating in Arizona. It is a field guide that clearly identifies responsibilities, resources, communication details, and other fire-related resources.		Daily	Comment [DBH16]: We will include URL in the next draft
<i>SOP Name</i>	<i>Agencies Included</i>	<i>Disciplines Included</i>	<i>SOP Location*</i>	<i>NIMS-Compliance</i>	<i>Frequency of Use</i>	
<i>SOP Name:</i> Local Communication Center SOPs <i>SOP Description</i>	All public service providers	Fire, EMS, Law Enforcement, Government,	Found at Communications Centers Communications Centers have dedicated SOPs guiding communications officers, call-takers and dispatchers, as well as first responders and government entities in procedures and protocols specific to that center.	Yes	Daily	
<i>SOP Name:</i> <i>SOP Description</i>						

TABLE 22 - STANDARD OPERATING PROCEDURES

* Where is the SOP made available to the state emergency response community? (e.g., Web site, newsletter, etc.)

4.3.1 EXISTING INTEROPERABLE COMMUNICATIONS SOPS



Arizona Interagency Radio System (AIRS)

Description: The PSCC and DPS recognized a lack of interoperability among the existing public safety radio networks in the state. To address this problem, they deployed the Arizona Interagency Radio System to provide responders with basic interoperability until a permanent solution is developed. While AIRS provides basic interoperability by patching together disparate frequency bands on a single talk group, it is recognized that this is a very limited capability and interoperability that is more comprehensive with greater functionality is a priority for the future.

SOPs: In addition to a technology refresh for AIRS, the Arizona SIEC addressed the basic operational aspects of the AIRS network with operational policies and procedures by publishing an initial set of user-based standards that will ultimately lead to the development and implementation of statewide operational standards. The Arizona SIEC has also established a standardized nomenclature for the AIRS network mutual aid channels and related, non-networked, national and regional mutual aid channels. All of this information is unrestricted and publicly available on the Arizona Department of Public Safety website:

<http://www.azdps.gov/pssc/documents/AIRSPolicy.2.2.07.pdf>

The guidelines for AIRS include detailed explanations of the purpose of AIRS, who shall be the governing entity, and who are eligible users. Additionally, there are definitions and clear operational guidelines governing channel use and priority levels. The guidelines go into further detail, identifying Communications Center responsibilities as well as Command and Control responsibilities in support of and compliance with NIMS and ICS. Finally, the document defines Field User responsibilities and system failure contingencies.

Programming guide

Description: *The Subscriber Programming Guide – Arizona Mutual Aid and Interoperability Channels* is a concise one-page document listing the frequencies and channels to be used for interoperability across the state.

SOP: The guide uses common naming structures to ensure clear identification regardless of user agency or discipline. It also identifies bandwidth, transmit and receive frequencies and it coordinates the VHF, UHF and 800 MHz bands for the state interoperability network. It is available



publically through the Statewide Interoperability Executive Committee website.

Arizona Fire Mutual Aid Plan

Description: This document is fully NIMS-compliant and used for multi-hazard response planning. The plan provides coordination and a systematic approach for all fire and rescue service agencies to use during management of incidents beyond the agency's original capabilities. Additionally, the plan provides equipment inventories and it promotes training and exercise between emergency service providers. The plan is an extension of the Arizona State Response and Recovery Plan and was authored considering the needs of local, county, tribal and state responders.

SOP: The document includes twelve sections and takes a comprehensive approach toward coordinating fire service responses. There is clear guidance on which procedures are to be used and when. The document includes sections for review and updating, and integrates several other guides, such as the Multi-Agency Coordination System (MAC) Procedure Guide, Resource Designation System, and local Dispatch and Activation guidelines. The document is available at

http://azchiefs.publicaware.com/Assets/dept_1/PM/pdf/Mutual_Aid_Plan.pdf

AFOG

Description: The *Arizona Field Operations Guide* is a comprehensive field manual for the fire service. The guide includes sixteen chapters with three appendices. Commanders' Responsibilities, mutual aid requests and deliveries, Urban Search and Rescue, and safety and accountability are among the many fire-related programs and procedures explained in detail. Additionally, the document covers several related NIMS/ICS sections such as Command, Logistics, Operations, Planning and Finance. *Appendix A "Communications"* provides excellent explanations and guidance of the channels, frequencies, and procedures for operating in Arizona. It defines tower/repeater locations and operational details, use of National and State Tactical and Calling channels, and includes maps of coverage areas identifying channels to be used based upon user location.



Local Communications Centers SOPs

Description: Independent Communications Centers have dedicated standard operating procedures and policies giving guidance to employees and center users.

SOPs: These guides will contain procedures for all aspects of the center's operations including but not limited to answering phones, paging for emergency and non-emergency calls, equipment operation including interoperability gateways and electronic patching, and the selection of repeater locations for coverage control. In addition to specific equipment procedures, the documents should contain protocols for dispute resolution, archiving and historical recall, and employee-related rules, such as ethical conduct. SOPs of this nature are reviewed regularly with employees and users and are enforced by the Communications Center Supervisors, Directors and Field Coordinators. They are distributed to all employees and user agency commanders and generally are not available to the public at large.

ARIZONA SIEC VHF Minimum Equipment Standards

Description: The SIEC has adopted nationally recognized feature sets for VHF equipment that promotes interoperability.

SOP: This document is one page in length and details minimum channel capacity, channel display, frequency range, narrowband capability and P-25 capability. It is available on the SIEC website.

<http://www.azdps.gov/pssc/documents/vhfminimumequipstandards.pdf>

AZ SIEC UHF Minimum Equipment Standards

Description: The SIEC has adopted nationally recognized feature sets for VHF equipment that promote interoperability.

SOP: This document is one page in length and details minimum channel capacity, channel display, frequency range, narrowband capability and P-25 capability. It is available on the SIEC website.

<http://www.azdps.gov/pssc/documents/uhfminimumequipstandards.pdf>



- Others?

Comment [DBH17]: We are continuing to look for additional SOPs – issue is that most are controlled by local governments

4.3.2 DOCUMENTATION OF SOPs

The Standard Operating Procedures for AIRS are published on the SIEC website (and are available in Appendix A of this SCIP). They are also available through contact with the PSCC Support Office.

4.4.3 SOP JURISDICTIONS

The State-sponsored SOPs related to use of the “Interoperability”-identified channels cover all jurisdictions providing public safety services in Arizona that wish to access those channels.

4.3.4 WHO DEVELOPED EXISTING AND HOW OLD ARE THEY

The AIRS SOPs was established in May 2006. Since that time, there have been several revisions to the programming guide, however the MOU and other salient information has remained constant.

4.3.5 HOW IS SOP INFORMATION RELAYED AND WHAT SUPPORTIVE TRAINING IS AVAILABLE?

Information about AIRS is shared with others online from the PSCC Website. Additionally, trainers with the Department of Emergency Management of Military Affairs share this information when they visit each of the local government’s Emergency Operations Centers.

There is currently no specific training required or needed for AIRS. The system, requirements, and use are so intuitive, that all entities are able to use it when necessary without training. This is evidenced by how often and how well the system works as a primary interoperability channel.

4.3.6 DO SOPs HAVE BINDING AUTHORITY?

Comment [DBH18]: Legal opinion will be included in next draft

4.3.7 MUTUAL AID AGREEMENTS, MEMORANDUMS OF UNDERSTANDINGS, MEMORANDUMS OF AGREEMENTS THAT COVER INTEROPERABLE COMMUNICATIONS IN THE STATE

Comment [DBH19]: We are aware of AIRS but cannot determine if there are others

The state of Arizona has MOUs with local and tribal entities regarding the use of the AIRS interoperability system. (A copy of the AIRS MOU document can be found at the following location: <http://www.azdps.gov/psc/survey.asp>.)



Additionally, the state has MOUs with all bordering states and with Mexico governing how they are to communicate as well as assist each other in times of emergency.

4.3.8 SOPs DEVELOPED TO COVER ALL DISCIPLINES, JURISDICTIONS AND LEVELS OF GOVERNMENT

Standard Operating Procedures authored by the PSCC and SIEC were developed to guide all interoperability channel users regardless of jurisdiction or discipline. The guidelines were drafted generically to allow individual user judgment as to proper actions in any given situation, but specifically enough to address each discipline's interoperability role to ensure successful interoperable connectivity.

4.3.9 SOPs TRACKED AND ENFORCED TO INSURE COMPLIANCE

Typically, the state does not track, nor do they actively enforce, compliance SOPs.

4.3.10 PROCESS TO INSURE SOPs ARE REVIEWED AND UPDATED

The SIEC, a subcommittee of the PSCC, reviews the SOP for AIRS on a regular basis.

Additionally, a SOP governs communications between the Arizona and Sonora, Mexico. That SOP is reviewed by both jurisdictions regularly and modified as required. The SOP includes the equipment and procedures to contact and work with each government.

4.3.11 ARE THERE ITEMS IN CURRENT SOPs THAT CONFLICT WITH STANDARDS OR CURRENT INITIATIVES?

AIRS is fully compliant with the standards and current initiatives of the state interoperability plan.

The SOP between Arizona and Sonora, Mexico is also fully compliant with the State's communications plans and with NIMS.

4.3.12 DO CURRENT SOPs INCORPORATE NIMS?

Where appropriate, SOPs use NIMS and ICS terminology. They reflect command, operation, and communications as directed by NIMS. The SOPs authored by the



PSCC and the SIEC, the governing bodies of Arizona's Interoperability program, are NIMS-compliant.

4.3.13 ICS TRAINING GIVEN TO CURRENT COMMUNICATIONS PERSONNEL

Although the state of Arizona delivers ICS training as part of their statewide training program, it is local government's responsibility to determine which communications personnel receive the training.

4.3.14 STATE CREDENTIALING OF (COMMUNICATIONS) PERSONNEL

All classes taught by the state are tracked through a computerized tracking system and is available to the student, and those authorized to receive this information under United States and Arizona privacy laws.

4.3.15 NECESSARY CURRICULUM TO ENSURE THAT A SUFFICIENT NUMBER OF PERSONNEL THROUGHOUT THE STATE ARE QUALIFIED TO SERVE AS COMMUNICATIONS UNIT LEADERS

Most Communications Unit Leaders are local positions and not currently provided by the state, therefore, there is no measurable way to determine if there are or are not an adequate number of Communications Unit Leaders in Arizona.

Comment [DBH20]: Question to ICTAP:
What is the definition of "sufficient number of personnel" to serve as communication leaders?

4.3.16 SOPs INCLUDE CURRENT LISTINGS OF QUALIFIED PERSONNEL TO STAFF COMMUNICATIONS UNIT FUNCTIONS? IS THE LISTING IN AN APPENDIX TO ALLOW UPDATING WITHOUT REISSUING THE ENTIRE DOCUMENT?

The only SOP the state currently has is AIRS. This requirement is not necessary for the operations of AIRS.

Comment [DBH21]: We are in the process of getting additional SOPs and will address this when we have additional information.

As this is typically a local government function, the state does not maintain a listing of qualified personnel to staff the Communications Unit function.

4.4 TRAINING AND EXERCISE PLAN

4.4.1 STATEWIDE PLAN FOR INTEROPERABILITY COMMUNICATIONS TRAINING

As the state has a regular and intensive training program designed to instruct emergency responders in NIMS, a certain amount of that training includes communications training. However, the state does not maintain a separate training class or curriculum for "interoperability communications training."



Rather, in most cases, those process and procedures are taught at the local government level. It is at that level where local governments can instruct their public safety providers the interoperability requirements and options available and unique to their jurisdictions.

4.4.2 EXERCISE PLAN FOR STATE AGENCIES

The state has an extensive training program that is conducted both by individual agencies and by DEMA. Exercises offered to state agencies are also offered to local and tribal entities as well. In addition to participating with local governments on exercises that cross-jurisdictional and disciplinary boundaries, DEMA conducts a series of exercises that rotate on an annual basis. In one recent rotation, DEMA conducted tabletop exercises one year, followed by a functional exercise the following year, and a full scale exercise the third year.

This year, Arizona will be participating in TOPOFF-4, a federal exercise. Additionally, other exercise programs are being worked on including exercises on chemical issues, pandemics, bird flu and cyber-terrorism.

4.4.3 EXERCISE PLAN FOR LOCAL, AND TRIBAL GOVERNMENT

As outlined above, there is little difference between the exercises offered to local and tribal governments as those offered to state agencies. Every attempt is made by DEMA to recruit participants from all levels of government to participate in their training programs.

4.4.4 POLICY IMPLICATIONS AND CERTIFICATIONS

As a matter of public policy, and to ensure public safety, the state stands ready to assist local and tribal governments in creating training that is of value to them. Training for the most part follows the rules and regulations created by the United States Department of Homeland Security, as most often, local governments require the assistance of DHS to help fund the training. DEMA, however, is able to provide training on a cost recovery basis to any entity.

As the statewide radio system emerges to be the interoperable radio solution of choice, the PSCC would prefer to require all responders in the state of Arizona to include as part of their annual in-service training refresher courses on the proper use of interoperable radio devices. These annual in-training components should be established and approved by DEMA in consultation with the PSCC. Additionally, personnel should be tested on their ability to understand the SOPs,



as well as meet the defined requirements when performing their job duties to ensure the safety of the state's citizens, and the responders themselves.

In addition to regular user education, exercises should be conducted across jurisdictions and disciplines to ensure the practices used are up-to-date and well understood. This can be done by conducting full scale or tabletop exercises but realistic exercises are most useful to determine plan viability. These exercises should be conducted regularly, as response times, operational limitations, personnel and equipment change. Tabletop exercises are useful to discuss, plan, coordinate and/or document emergency response plans and procedures, normally at the command level. Full scale exercises give experience and generate feedback from all levels of responders.

4.4.5 PROCESS BY WHICH THE STATE WILL DEVELOP MANAGE, MAINTAIN, AND UPGRADE OR COORDINATE AS APPROPRIATE

Comment [DBH22]: Will be added with next draft of SCIP

4.4.6 THE PROCESS FOR OFFERING AND REQUIRING TRAINING AND REQUIRING ANY TRAINING AND EXERCISES AS WELL AS ANY CERTIFICATION THAT MAY BE NEEDED

Comment [DBH23]: Will be added with next draft of SCIP

4.4.7 EXPLAIN HOW THE PROCESS ENSURES THAT TRAINING IS CROSS DISCIPLINARY

All training conducted by the state DEMA is, to the extent possible, cross-disciplinary. Classes are usually taught with instructors representing two different disciplines. This is done to ensure that those that who are attending the classes understand how important it is to include personnel from other disciplines in training, and in real life how important it is to represent a true first responder community.

To further help training become cross-disciplinary, whenever possible, classes are open and encouraged for all who wish to attend. There are exceptions to this that are due to the nature of the classes or prerequisites. For example, there may be some HazMat classes that law enforcement may not meet the minimum requirements for and thus are not allowed to enroll in, or other classes for law enforcement that fire fighters cannot attend.

4.5 USAGE

A person's ability to use equipment proficiently increases when they become familiar with it through repeated use. It is the PSCC's long-term goal to migrate to a statewide, interoperable radio system that will be used by all state, local, tribal, and federal government entities on a daily basis. Until that time however, the state will continue to promote of the use of AIRS for interoperable



communications. The PSCC also supports those jurisdictions that have already migrated to standards-based radio systems that will be compatible with the state radio system, when that system is enabled.

4.5.1 DAILY INTEROPERABILITY

In those areas of the state with shared radio systems, daily interoperability exists today. In those areas (generally larger jurisdictions), their interoperability level using the SAFECOM Interoperability Continuum (seen in Figure 20 below) is at a level highest level of interoperability within their jurisdictional environments. When agencies are called to assist other areas, or when requiring assistance from others, they rely on the Arizona Interagency Radio System (AIRS) for communications. (AIRS is described in Section 4.0.2 of this report and is described in the SAFECOM Interoperability Continuum as a Shared Channel Level Interoperability.)

Absent the areas in the state where there are existing multi-jurisdictional and multi-disciplinary radio systems, Arizona does not typically use a common radio system, with the single exception of the AIRS network for emergency radio traffic. AIRS is fully interoperable and available to any jurisdiction or emergency responder no matter his discipline who has agreed to abide by the Memorandum of Understanding governing system use.

For purposes of this SCIP, we make two assumptions:

1. The statewide radio system is fully deployed with all agencies either on the system or on having the ability to communicate with the network via a regional connection.
2. AIRS is deployed statewide, in a similar fashion as it is today, with all available jurisdictions using the network.





FIGURE 20- SAFECOM INTEROPERABILITY CONTINUUM¹⁴

Statewide radio network

As the new 700 MHz statewide radio network has been deployed, emergency responders use this system on a daily basis. This system will represent the highest level of interoperability in the SAFECOM Interoperability Continuum. Those agencies not operating directly on the statewide system will be able to operate as they do today. They will be able to communicate with each other using their own networks and they will, on a regional basis, be able to link into the

¹⁴ The SAFECOM Interoperability Continuum is a work product of SAFECOM, Department of Homeland Security. www.safecomprogram.com



statewide radio system via a high level network interface (gateway device), or by sharing channels with the state. This will afford them either a Gateway Level or a Shared Channel Level of interoperability level as measured by SAFECOM.

The PSCC promotes the concept of interoperability on a daily basis through an Outreach Program, open public meetings, as well as a user-friendly Website and a regular newsletter. Additionally, there is continued dialogue between the PSCC and the local agencies through dialogue with the agencies' representatives who serve on the Commission.

AIRS

The AIRS network affords the opportunity for any emergency responder to communicate with others as needed via a suite of fully interoperable, patched radio frequencies in the UHF, VHF, and 800 MHz bands. Although AIRS is still under development, it is currently available in most areas of the state. By mid-2009, AIRS will be available statewide.

The AIRS Programming Guide is included in Figure 21 (next page).

Strategy

Arizona has developed a strategy to achieve statewide interoperability communications. The strategy is included in Table 22 below.

Strategy Number	Strategy	Due date
1.1	Demonstration project for the 700 MHz Project 25 Radio System	April 2008
1.2	Use interoperability channels and capabilities for day-to-day interoperable communications	Mid-2008
1.3	Complete statewide microwave upgrade to digital	2013
1.4	Provide that access to interoperable communications capabilities is kept as simple as possible for end users (Statewide 700 MHz Radio System)	2013

TABLE 23- SHORT TERM STRATEGY FOR INTEROPERABILITY





STATEWIDE INTEROPERABILITY EXECUTIVE COMMITTEE

TITLE: SUBSCRIBER PROGRAMMING GUIDE -
ARIZONA MUTUAL AID and INTEROPERABILITY
CHANNELS

DATE January 24, 2007

POLICY # 07-005

Replaces Policy # 07-005 rev. 1.0 per ARRC
decision on 01/24/2007

REV # 1.1

VHF CHANNELS

AZ-SIEC NAME	BAND- WIDTH	TX FREQ MHz	TX CTCSS Hz	RX FREQ MHz	RX CTCSS Hz	NCC NAME
AIRSAZ	25 KHZ	155.190	156.7	155.475	CSQ	
AIRS1	25 KHZ	155.190	141.3	155.475	CSQ	
AIRS2	25 KHZ	155.190	131.8	155.475	CSQ	
AIRS3	25 KHZ	155.190	110.9	155.475	CSQ	
AIRS4	25 KHZ	155.190	123.0	155.475	CSQ	
AIRS5	25 KHZ	155.190	167.9	155.475	CSQ	
VAIRS D	25 KHZ	155.475	156.7	155.475	CSQ	1LAW16
VCALL	12.5 KHZ	155.7525	156.7	155.7525	CSQ	1CAL18
VTAC1	12.5 KHZ	151.1375	156.7	151.1375	CSQ	1TAC5
VTAC2	12.5 KHZ	154.4525	156.7	154.4525	CSQ	1TAC13
VTAC3	12.5 KHZ	158.7375	156.7	158.7375	CSQ	1TAC22
VTAC4	12.5 KHZ	159.4725	156.7	159.4725	CSQ	1TAC23

UHF CHANNELS

AZ-SIEC NAME	BAND- WIDTH	TX FREQ MHz	TX CTCSS Hz	RX FREQ MHz	RX CTCSS Hz	NCC NAME
AIRSAZ	25 KHZ	465.375	100.0	460.375	CSQ	
AIRS1	25 KHZ	465.375	141.3	460.375	CSQ	
AIRS2	25 KHZ	465.375	131.8	460.375	CSQ	
AIRS3	25 KHZ	465.375	110.9	460.375	CSQ	
AIRS4	25 KHZ	465.375	123.0	460.375	CSQ	
AIRS5	25 KHZ	465.375	167.9	460.375	CSQ	
UAIRS D	25 KHZ	460.375	100.0	460.375	CSQ	
UCALL	12.5 KHZ	458.2125	156.7	453.2125	CSQ	4CAL27
UCALL D	12.5 KHZ	453.2125	156.7	453.2125	CSQ	4CAL27D
UTAC1	12.5 KHZ	458.4625	156.7	453.4625	CSQ	4TAC28
UTAC1 D	12.5 KHZ	453.4625	156.7	453.4625	CSQ	4TAC28D
UTAC2	12.5 KHZ	458.7125	156.7	453.7125	CSQ	4TAC29
UTAC2 D	12.5 KHZ	453.7125	156.7	453.7125	CSQ	4TAC29D
UTAC3	12.5 KHZ	458.8625	156.7	453.8625	CSQ	4TAC30
UTAC3 D	12.5 KHZ	453.8625	156.7	453.8625	CSQ	4TAC30D

800 MHz CHANNELS

AZ-SIEC NAME	BAND- WIDTH	TX FREQ MHz	TX CTCSS Hz	RX FREQ MHz	RX CTCSS Hz	NCC NAME
AIRSAZ	20 KHZ	821.0125	156.7	866.0125	CSQ	8CAL90
AIRS1	20 KHZ	821.0125	141.3	866.0125	CSQ	8CAL90
AIRS2	20 KHZ	821.0125	131.8	866.0125	CSQ	8CAL90
AIRS3	20 KHZ	821.0125	110.9	866.0125	CSQ	8CAL90
AIRS4	20 KHZ	821.0125	123.0	866.0125	CSQ	8CAL90
AIRS5	20 KHZ	821.0125	167.9	866.0125	CSQ	8CAL90
8AIRS D	20 KHZ	866.0125	156.7	866.0125	CSQ	8CAL90D
8TAC1	20 KHZ	821.5125	156.7	866.5125	CSQ	8TAC91
8TAC1 D	20 KHZ	866.5125	156.7	866.5125	CSQ	8TAC91D
8TAC2	20 KHZ	822.0125	156.7	867.0125	CSQ	8TAC92
8TAC2 D	20 KHZ	867.0125	156.7	867.0125	CSQ	8TAC92D
8TAC3	20 KHZ	822.5125	156.7	867.5125	CSQ	8TAC93
8TAC3 D	20 KHZ	867.5125	156.7	867.5125	CSQ	8TAC93D
8TAC4	20 KHZ	823.0125	156.7	868.0125	CSQ	8TAC94
8TAC4 D	20 KHZ	868.0125	156.7	868.0125	CSQ	8TAC94D
8TAC5	20 KHZ	821.0375	156.7	866.0375	CSQ	
8TAC5 D	20 KHZ	866.0375	156.7	866.0375	CSQ	

Figure 21 - AIRS programming guide¹⁵

¹⁵ This document is available on the Web at:

<http://www.azdps.gov/pssc/documents/subscriberprogrammingguide.pdf>



4.5.2 HOW IS INTEROPERABILITY USED FOR INCIDENTS AND EVENTS AT THE LOCAL, REGIONAL, TRIBAL, AND STATE EVENTS

Interoperability is used daily for incidents at the local level of government. It is used less regularly of incidents at the regional and state level. This occurs primarily because of the size of each of the counties that comprise the state. Unlike many states, Arizona has a relatively large landmass, and has only 15 counties. Events may be planned or unplanned. In most unplanned events, as a police chase, the immediate need is created, and most often ends within a few minutes. In the cases of fire, the need often lasts longer. For planned events, like the Super Bowl or the New Years Eve festival in Tempe, other, more elaborate interoperability solutions can be designed.

The state has two ways of dealing with interoperability in large-scale events both planned and unplanned.

- When an incident escalates beyond the local level, and additional communications assets are required, the local government can request the use of a command communications vehicle. There are six vehicles placed in strategic locations around the state to ensure the shortest response times. When deployed, the vehicles are staffed by trained employees who are NIMS-qualified Communications personnel. From the time a call is placed to the time this asset is deployed on location is generally within three hours. These vehicles all have the same equipment and consists of the following:
 - Cross-band communication device (ACU-1000)
 - Full suite of radios, including VHF, UHF, and 700/800 MHz
 - Satellite communications
 - Generator

One of these units is further equipped with living quarters on board that is available for extended periods of operation.

- The state also uses AIRS, which represents the primary, and most-often used form of interoperability in the state.

Frequency of use



There is no accurate way to measure the use of AIRS in its present configuration. As designed and constructed, the network does not require an operations center and there is no managing software to monitor and report on usage.

DEMA becomes aware of the use of the communications vehicles after they are notified by the local government entity who maintains them. Based upon antidotal information at this time, it is believed these vehicles are deployed approximately 10 to 15 times each year.

Comment [DBH24]: We will need to follow up on this with DEMA and AZ Emergency Managers

Additional information with next draft of report

Frequency of use for localized emergency incidents

Based upon antidotal information, AIRS is used by local government on a daily basis. The use of other interoperable devices or processes is not monitored and unknown.

Comment [DBH25]: AZ Emergency Managers

Additional information in next draft of report

How often are interoperable communications capabilities used for regional incident management?

Cannot count the number of AIRS – AZ Emergency Managers may have this data.

4.5.3 PROCEDURES FOR ESCALATION AND OBTAINING OUTSIDE SUPPORT

When local government entities require outside support they follow the NIMS protocol. Specifically, a local government would contact the county government, who in turn would contact the state EOC. Should the state need additional resources, they would use the Interstate Emergency Management Compact (EMAC) and then turn to the Federal Emergency Management Agency (FEMA).

4.5.4 ARE THERE MUTUAL AID AGREEMENTS (MAAs) IN PLACE FOR SPECIFIC OCCASIONS?

(I.E. major events, sporting events, parades, marathons, etc.)

In addition to mutual aid agreements that are used for day-to-day operations, there are some agreements for specific functions, that include (but not limited to) parades, marathons, gold tournaments, NASCAR, Super Bowl, Tempe New Years Eve Celebration, Fiesta Bowl, etc.

Included in the MAAs

Before each event, the event planners go through an extensive process that attempts to determine every eventuality that could take place at the event or



function. To the extent possible, MAAs are arranged with those who have a reasonable expectation to be required for the event.

4.5.5 INTEROPERABILITY USED FOR DISASTERS OR OTHER SIGNIFICANT EVENTS REQUIRING SUPPORT FOR REGIONAL, STATE, OR NATIONAL ASSETS

The state of Arizona has signed the Emergency Management Compact (EMAC). All counties within the state have signed MOUs with the state to provide emergency assistance when necessary within the state. When activated either within the state, or outside of the state, NIMS is the protocol that is used for all communications, both within the operating environment and for interoperable communications with others.



5.0 STRATEGY

5.1 INTEROPERABILITY VISION

Presently in Arizona, emergency service providers and their supporting organizations find themselves in a position of not being able to communicate with each other in times of emergency. This scenario plays out on a daily basis regardless of the size of the incident, two law enforcement units in a vehicular chase, or dozens of departments responding to an incident of magnitude. Oftentimes communications barriers are created by incompatible technology, or public service providers have not planned adequately to provide these communications in advance. This lack of communications causes needless delays in getting life-saving services to those who need them; it also puts the lives of public safety officials at risk, by not providing the very lifeline they need to get them assistance, while they are helping others. The PSCC has therefore created a vision that addresses these shortcomings.

The vision for statewide interoperability is one that will enable any public safety official to be able to communicate with any other public safety official, “when their mission dictates, in real-time, and on demand¹⁶.” This is not to say that every police officer should be able to communicate with every fire fighter. Rather, it is the communications, requirement as determined by a Unified Command structure (a component of NIMS).

5.2 MISSION

The Arizona Public Safety Communications Commission as well as their mission for statewide interoperability is to enable the “seamless interagency and inter-discipline public safety communications without complicated processes or procedures for task force events, mutual aid incidents as well as day-to-day operations irrespective of agencies’ technical systems.” This mission as defined by the PSCC aligns with the overall mission of this SCIP. The mission of the SCIP is to create a seamless inter-jurisdictional and inter-disciplinary fully interoperable radio system, for all public safety entities operating within the state of Arizona.

5.3 GOALS AND OBJECTIVES

¹⁶ Public Safety Wireless Network (PSWN) publication *Why Can't We Talk*.



To achieve this goal of statewide interoperability, the state is phasing in a new statewide wireless network in the 700 MHz band. Understanding the complications of undertaking such a project, the PSCC is simultaneously updating the existing microwave network and the Arizona Interagency Radio System (AIRS) to encourage and enable connectivity of legacy networks in pursuit of statewide interoperable communications.

By deploying both technologies, the state of Arizona will achieve Governor Napolitano's stated goal of 85% interoperability (by population) within two years. Although this interoperability will be somewhat rudimentary, it will provide basic communications for all public safety providers operating within the state. As the 700 MHz system is deployed, the level of interoperability will increase to enable the true vision of complete state interoperable communications.

Formulation of Goals and Objectives

The PSCC recognizes the critical nature of planning for more than technology in solutions for statewide interagency communications system and a supporting operations plan. In October 2005, the PSCC published its "Concept of Operations," a non-technical document expressing the philosophy of the public safety officials of the Commission. Although technology and budget issues are always in the forefront and headlines of most interoperability projects, the PSCC called specific attention to the over arching need to address governance, ownership and management of large, statewide or regional systems. The Commission through its "Concept of Operations" also called attention to the importance of standard operating procedures to encourage regular, daily use of interagency communications, not just during training operations or declared emergencies.

The PSCC is planning to deploy a standards-based system that will provide for compatibility with other standards-based systems in the state. The *Needs Assessment* determined the future and current needs to interoperate with modern, standards-based land mobile radio communications systems currently installed or being planned in various counties and cities within the state of Arizona.

Strategy for Interoperability



The Gartner report, entitled *State of Arizona Statewide Wireless Public Safety Solution Concept of Operations* (known as the ConOps), dated October 26, 2005, set forth a pathway toward interoperability that the PSCC has adopted as its guide. The following quotes pages 31-33 as the strategy for statewide interoperability:

Summary of Strategy for Achieving Statewide Interoperability in Arizona

Based on the information presented in previous sections and the goals, constraints, and requirements related to achieving interoperability in the state of Arizona, an overall strategy was developed. The strategy, while uniquely crafted for the specific needs of Arizona, aligns with best practices recommended by industry sources. For instance, it includes all the best practices for interoperability strategy developed by the Public Safety Wireless Network (PSWN) Program (now formally part of SAFECOM). The four major best practices for interoperability strategy according to PSWN are listed in Table 23 below.

- | | |
|----|--|
| 1) | Cultivate Political and Stakeholder Support |
| 2) | Determine System(s) Planning Requirements |
| 3) | Provide Education to Groups Within the state |
| 4) | Coordinate the Activities of Multiple Agencies and Build Consensus |

TABLE 24- PSWN BEST PRACTICES FOR STATEWIDE INTEROPERABILITY¹⁷

All of these activities, in addition to other key activities, comprise the strategy for the state of Arizona. The strategy can be summarized on two levels: short-term strategy and long-term strategy. Both components are described below and further described in Section 6, Key Milestones and Implementation Plan.

Short-term Strategy

In the short-term, it is imperative that the PSCC and its constituents aggressively pursue the county-by-county incremental improvements, gain several quick wins that can be actively communicated to stakeholders, and expands the influence of the PSCC itself. Addressing operational policies and procedures immediately, for instance, allows for

¹⁷ Source: SAFECOM, <http://www.safecomprogram.gov/SAFECOM/>



significant progress while more time-consuming efforts, such as securing funding and procurement activities are executed in parallel. In short, the short-term strategy for the PSCC to pursue during the next two to three years is as follows:

- Publish initial set of user-based standards and guidelines for technology consistent with the long-term strategy for agencies currently implementing changes
- Create a scorecard to assess current interoperability activities occurring throughout the state and in adjoining states
- Complete analyses and other data gathering efforts to feed subsequent next activities of the statewide strategy
- Develop and implement a strategy for defining technical alternatives for the statewide solution
- Establish an education and communications program that defines interoperability, PSCC goals, and the path to the solution
- Develop inventory of subscriber equipment to assist with scoping and funding the future solution
- Develop and implement statewide operational standards
- Aggressively identify and secure dedicated funding source(s)
- Secure short- and long-term legislative support by legislative body
- Assess and implement tactical improvements on a county by county basis to achieve quick wins that can be communicated as progress
- Establish/leverage working groups and subcommittees to address operational policies and procedures, governance and ownership, and funding strategies
- Encourage opportunities to share communications facilities and infrastructure among agencies

Long-term Strategy

Building off the achievements and momentum of the short-term strategy, the PSCC should employ a long-term strategy that achieves all of the requirements and objectives described in this document and supporting documentation. Long-term agreements to share facilities and infrastructure, increased cooperation and partnership in provision of public safety, and user-based standards for technology are a few of the long-term strategies that must be achieved. On realization of the long-



term strategy, the Mission and Vision of the PSCC will be achieved and public safety agencies within Arizona will finally experience seamless communication when helping the citizens of Arizona. As such, the long-term strategy, which spans years 3 through 8, is comprised of the following:

- Secure long-term funding support (e.g., capital for build out, on-going maintenance requirements, and technology refresh)
- Define a long-term governance and ownership model
- Pilot an interoperable solution based on the new architecture to assess effectiveness and plan for statewide deployment
- Publish a full deployment plan and partially deploy a statewide, interoperable solution
- Deploy new microwave infrastructure
- Fully deploy the statewide, interoperable solution

Specific activities, milestones, durations, and dependencies to support the short- and long-term strategies are described in detail in Section 6. Execution of this two-tiered strategy provides the road map for interoperable communications and the increased protection of life and property in the state of Arizona. However, to realize the strategy and put it into action, the funding strategy must be carefully and aggressively executed as defined in the next section.

5.4 STRATEGIC INITIATIVES

The PSCC has a series of strategic initiatives, all of which will support the eventual build-out of a statewide 700 MHz fully interoperable radio system for the state of Arizona.

Statewide microwave upgrade

In order to support the envisioned statewide Project-25 700 MHz radio system, the state must first build up their microwave ring. This three-phased approach has already started, and is planned to be completed in 2013.

Measureable results - This project has three phases, each phase with specific goals and objectives. The PSCC monitors the progress of this project on a regular basis. Success is measured against a project plan, with milestones, goals, and completion dates.



AIRS

As there is an immediate need for interoperable communications in the state, the PSCC is continuing to update and build out the AIRS suite of interoperability systems. Since this will allow immediate interoperability, and will enable interoperability with others who may need to assist Arizona in times of an emergency, this system will create an immediate and long-lasting solution for interoperability in Arizona.

Measurable results - Like other projects monitored by the PSCC, regular reports are presented to them to monitor the progress of this project. The PSCC has asked the SIEC to also monitor this project and create a series of objectives to be completed by certain dates.

700 MHz Project 25 Project

The 700 MHz Project 25 Project is scheduled for completion in 2013. When deployed, this 700 MHz system will enable interoperable communications in the most populated areas of the state. In 2008, a Demonstration Project will provide a proof of concept for this technology before being deployed statewide.

- Measurable results - The overall project and the Demonstration Project are actively being monitored by the PSCC. Reports are presented to that body at every meeting. PSCC is creating a series of easily monitored milestones.

Throughout this SCIP there are many references to a series of key issues that are part of the statewide plan. What follows is a summary of many of these issues.

Locals ability to connect to state system

No matter if a government entity wishes to join the statewide radio system or if they wish to remain independent, there will be a high-level, network connection in place to enable that entity to communicate with other agencies when they need to do so. This interface can be several different methods, depending on the degree of ease of use, frequency of use, coverage area, system type, and so on. At the very minimum, interoperability will always be available for all agencies through the AIRS network.

Caches and Emergency Equipment



Today, the state has a limited number of radio caches and radio equipment that can be used in a time of emergency. Even when the state migrates to the 700 MHz radio system, there will always be the need to have this equipment ready for those who may come into the state to provide assistance to this state. Having caches and equipment strategically placed in areas of the state, will therefore be advantageous to the state today and for the foreseeable future.

Interstate and Inter-country Interoperability (Mexico/4-Corners)

Although the state is part of Emergency Management Compact, which includes MOUs with each other state, it is important that planning for emergencies continue in our state. These planning efforts should include our Border States and Mexico. Having the agreements is the first step in creating a solid plan for interstate and international planning.

Data interoperability

The statewide 700 MHz radio system will be a Project 25 standards-based system. Inherent with Project 25 equipment comes low speed data. There currently is no plan in place on this new statewide system to include data interoperability.

Catastrophic loss of communications assets (redundancy)

As mentioned earlier in this SCIP, the statewide 700 MHz system relies on a series of other components to ensure that it is resilient. In addition to the basic technology, this system will have multiple layers of redundancy for example; the microwave is based on a loop configuration, thereby making it less vulnerable to a single point of failure. AIRS will always be a back up to the primary system, and will be available to all levels of government. AIRS is monitored by the three Dispatch Centers operated by the Arizona Department of Public Safety. Still another backup plan is the satellite phone system that the state has deployed between Emergency Operations Centers (EOCs). The Arizona Department of Emergency Management has been permitted to use the Arizona Public Service (APS) trunked radio system for another EOC-to-EOC back-up. Together, the statewide system will be redundant, resilient, and reliable for many years to come.

5.5 NATIONAL INCIDENT MANAGEMENT SYSTEM (NIMS) COMPLIANCE



On February 28, 2003, the President of the United States issued Homeland Security Presidential Directive (HSPD)-5, which directs the Secretary of Homeland Security to develop and administer a National Incident Management System (NIMS). NIMS identifies many of the goals and objectives of a common interoperable communications network, mainly a clear and common understanding to improve the delivery of emergency services and incident management.

5.5.1 STATE PLAN NIMS-COMPLIANT

The state plan will be fully NIMS-compliant. As Arizona's statewide 700 MHz interoperable radio system is being built, participating emergency responders will be able to communicate when required to do so. Part of the state plan is to create a Standard Operating Procedure that will include ICS and NIMS Communications Requirements. Until the state has the 700 MHz Radio System, the state uses the AIRS system. AIRS is a suite of interoperable radio channels that permits conversations between responders regardless of their frequency band. Once deployed, the AIRS system enables an On Scene Incident Command System that may be used by an Incident Commander (IC) to deploy their assets when and where they are needed. The IC then communicates with other Commanders, who in turn use their own radios to deploy their resources. The new 700 MHz network and the existing AIRS allows an Incident Commander to assign ICS roles and duties to incoming responders, as defined by NIMS, without concern for the individual's agency's communications frequencies.

5.5.2 CURRENT LEVEL OF NIMS COMPLIANCE AT ALL LEVELS OF THE STATE

Comment [DBH26]: This will be included in the next draft of this SCIP

5.5.3 NIMS REQUIREMENTS FOR LOCAL JURISDICTIONS

Comment [DBH27]: This will be included in the next draft of this SCIP

5.5.4 SUPPORT AND LEADERSHIP PROVIDED TO TRIBAL AND LOCAL ENTITIES

Comment [DBH28]: This will be included in the next draft of this SCIP

5.5.5 NIMS AND MAJOR TRANSIT

Although at this time, the major transit security components have not been actively participating in the statewide planning process, the state anticipates they will become engaged in the process, as the state continues to develop its statewide communications programs.



5.5.5 PSIC-FUNDED EQUIPMENT ENABLES NIMS-COMPLIANCE

The state and local governments will only submit requests for PSIC funds for equipment that will enable NIMS-compliance. For example, the state will submit an investment justification for the following technologies, each enabling the statewide interoperable communications system.

- Microwave enhancements – from analog to digital, in three phases, to be completed in 2013. This will serve as the statewide radio systems backbone.
- Continued build out of AIRS – this suite of interoperable radio frequencies requires NIMS-compliance to use this system. AIRS enables all responders to communicate with each other and to the Incident Commanders as they come into a coverage area, to be deployed offering assistance.
- Statewide Build out of the Project 25 700 MHz Radio System – This will assist local governments who have equipment that could work in this spectrum connect with the state radio systems. As the state radio system will require NIMS-compliance, this will therefore support NIMS in the state of Arizona.
- Assist local governments who will connect to the state system, and will not become part of the statewide network. This will require those who wish to join this network to become NIMS-compliant.

The state of Arizona is making every attempt to assist those who are not currently fully NIMS-compliant. To assist them, the state offers online classes, to encourage them, the PSCC requires NIMS-compliance for each system that they shepherd.

5.6 REVIEW AND UPDATE PROCESS

Recognizing that the statewide interoperability plan is a dynamic, living document, the PSCC has created a review and update process involving the emergency responder community of interest.

5.6.1 WHO CHAIRS THE REVIEW AND CYCLE SCHEDULE

The PSCC Executive Director or their designee, at least once a year starting in August, is tasked with ensuring proper review of the statewide interoperability plan. The frequency of this review may increase dependent upon the current interoperable environment assessment and completed strategic initiatives.



5.6.2 PROCESS TO CREATE A REVIEW COMMITTEE

The PSCC Executive Director will publish in advance of the next regularly scheduled PSCC meeting an agenda with an agenda item to update the PSIC Plan as part of that agenda. Additionally, the PSCC sends notifications to the emergency responder community of interest, advising its members of the upcoming meeting. A call for volunteers will be made to ensure the plan is vetted and reviewed by a representative sample of all jurisdictions and emergency responder disciplines in the state. The transmission letter will advise the recipients of the review's scope to help them understand the breadth of work required.

5.6.3 APPOINTMENT OF THE REVIEW COMMITTEE

At the PSCC meeting, the PSCC chair will receive a recommendations report from the PSCC staff for the review committee. The PSCC chair shall assign accepted topics for review to the appropriate review committee member(s). The PSCC chair will also appoint a chair of the committee and provide a timeframe for the final report and recommendation to be completed.

5.6.4 REVIEW OF THE STATEWIDE INTEROPERABILITY PLAN

The Review Committee chair shall hold open public meeting(s) at times and locations accessible by those willing to participate in this review. The Chair will send a notice to all emergency responders, using the same process detailed in section 5.6.2 above.

Input to this plan is not to be limited to those who are appointed to serve on the committee; rather it is open to all who wish to attend and be heard. Additionally, the Committee may entertain written responses.

At the conclusion of the review, the Chair or their designee shall prepare and present a report to the PSCC Chair including recommended changes to the Statewide Interoperability Plan. It will also include the minority opinions of those who made recommendations not entered into the final draft of the amended plan.

This review and its associated report will be sent to the PSCC Executive Director. The Director will review the plan and make a recommendation to the PSCC Chair.

5.6.5 RECOMMENDATIONS TO AMEND THE STATEWIDE INTEROPERABILITY PLAN



During the next regularly scheduled PSCC meeting, the PSCC Chair will receive the report from the Review Committee Chair and the PSCC Executive Director. During this open meeting, the suggested amendments will be discussed and approved or disapproved.

5.6.6 REVISED STATEWIDE INTEROPERABILITY COMMUNICATIONS PLAN DISTRIBUTION

After receiving PSCC, approval the Revised Statewide Interoperability Communications Plan will be distributed in a manner as outlined in Section 5.6.2 of this plan. The revised plan will include a log that will indicate the following:

Change log

A change log will be created that will include the changes made to the document by date, and chapter.



6.0 IMPLEMENTATION

The PSCC has been active in leading the efforts of the state towards improved communications interoperability. Previous state sponsored studies have resulted in real progress and interoperable systems continue to be implemented and have been credited with assisting agencies in high profile multi-agency operations.

Short term implementation -- AIRS

The implementation of the AIRS system began in early 2006 and continues to be built out according to the planning that occurred during 2004 and 2005. However, AIRS is based on the Interagency Radio System (IARS) which was planned and implemented during the earlier 1980s and has been serving law enforcement agencies for over two decades. The implementation will take place over a several year period as funding becomes available. The stages of this implementation are as follows:

Arizona Interagency Radio System (AIRS) implementation		
Design, Engineering, Planning		2004-
2005		
Installation begins		March 2006
Implementation of 45 AIRS suites complete		June
2008		
Implementation of dispatch center components complete		
June 2009		
Installation of AIRS in subscriber units		2005-2010
Integration of AIRS with the statewide radio system		
2012		

Long term implementation – Statewide 700 MHz radio system¹⁸

¹⁸ As the long-term plans for the statewide 700 MHz system go from the design to the implementation phase, milestones, specific deliverable dates, and critical paths will be included in the program management documents.



The leadership of moving toward improved interoperability can be credited to the individual agencies that formed the *ad hoc* committee that became the PSCC. Thereafter, the leadership of the PSCC as authorized by the Governor and State Legislature has carried interoperability further on the road to the statewide common infrastructure system as proposed today.

Implementation of the strategic initiatives (Section 5.4) is estimated to progress according the following schedule:

1. Governance

PSCC inception	2001
PSCC established officially	2004
PSCC and other state sponsored consultant studies	2004-2007
PSCC AIRS Memorandum of Understanding (MOU)	2005
Agencies agreeing to AIRS MOU (private and public agencies)	2005-2013 ¹⁹
PSCC Demonstration Project planning and coordination	2007-2008
PSCC-Phoenix-Mesa and PSCC-Yuma Demonstration MOU	2007
PSCC governance model planning	2006-2010
PSCC statewide system governance committee(s) established	2010
Determine funding sources and secure funding	2008-2013
Completion of interstate procedures and systems	2012

2. Planning

PSCC and other state sponsored consultant studies	2004-2007
PSCC planning & design of AIRS	2005-2010
PSCC planning & design of statewide system	2006-2013
PSCC Demonstration Project planning and coordination	2007-2008

¹⁹ As the statewide plan is implemented additional opportunities for participants will be identified. This will include opportunities to assist the state with governance, planning of SOPs, technical solutions, short- and long-term funding solutions.



PSCC planning of training for technicians, managers of system	
2007-2012	
PSCC planning of training for users	2010-
2013	
PSCC governance model planning	2006-
2010	
PSCC statewide system testing planning	2008-
2013	
PSCC planning for cutover of and migration to statewide system	2008-
2013	

3. Technology

State Design, Engineering, Planning of AIRS	2004-
2005	
AIRS Installation begins	
March 2006	
Implementation of 45 AIRS suites complete	June
2008	
Implementation of dispatch center AIRS components complete	June
2009	
Installation of AIRS in subscriber units	2005-
2010	
DPS engineering of microwave system upgrade	
2001-2012	
DPS installation of digital microwave components	2004-
2013	
PSCC planning & design of statewide system	2006-
2013	
PSCC determination of statewide architecture	2007
PSCC Demonstration Project planning and coordination	
2007-2008	
PSCC-Phoenix/Mesa-Yuma implement demo project	
2008	
PSCC-Phoenix/Mesa-Yuma test demo project	2008
State issues Request for Proposals for statewide system	2008
Vendor selected for statewide system	2008
Statewide system delivery, install, test, cutover	2009-
2012	
PSCC training for technicians	2008-
2012	
PSCC training for managers of system	2009-
2012	



PSCC training for users	2010-2013
Integration of AIRS with the statewide radio system	2012
Statewide system cutover complete	2012
Abandoned frequencies relinquished	2013

Notes on the statewide system implementation from the August 2007 Conceptual Design Report:

- o Since the radio system will be in a radio band that is currently not occupied, the system can be built on any timeframe decided without the concern for displaced systems or users. Therefore, the entire system could be constructed, and then users migrated to it in a manner suitable to the users. (The alternative in an already occupied band requires users to be migrated from old systems/channels to an interim system/channel and then to the new statewide system. This would require an extreme effort in planning and a substantial expenditure for interim operations.)
- o Since the statewide system will be in a band not currently used, a portion of the system could be constructed and users placed on it even before the entire system is placed into operation.
- o Old systems can be tied to the new system to allow orderly migration of users without significant impact to their operations.
- o Public safety operations must not be affected and communications must not be interrupted during any transition of systems.
- o The build-out of the statewide system is absolutely dependent on the DPS microwave and site upgrade project.
- o It is suggested that the sequence of implementation be as follows:
 1. A number of subscriber mobile and portable units for system testing.
 2. Repeaters installed where digital microwave and site improvements have been already completed (provides a portion of the system for testing).
 3. Central controllers (and regional controllers, if needed)
 4. Inter-system links
 5. Dispatch centers (with old channels connected to the new consoles)
 6. Repeaters where early cut-over may be required
 7. Smaller users connection to the system



8. Remainder of the repeaters
 9. Fill-in repeaters
- o Estimated installation times must be obtained from vendors and antenna riggers, but a preliminary estimate is as follows:
 - Antenna installation – 3 days per site
 - Radio install at sites – 2-3 days (assumes fully racked from vendor)
 - Radio/microwave interconnection and site testing – 1 day
 Therefore, the estimated installation time for is one week per site for implementation.
 - o Console and controller installation time cannot be estimated at this time.

4. Training

PSCC education of PSCC commissioners about interoperability	
2004-2008	
PSCC education of agencies about AIRS & its operation	
2005-2012	
PSCC education of agencies and public about statewide system	2006-
2013	
PSCC planning of training for technicians, managers of system	
2007-2012	
PSCC planning of training for users	2010-
2013	
PSCC training for technicians	2008-
2012	
PSCC training for managers of system	2009-
2012	
PSCC training for users	2010-
2013	

5. Replacement Planning

PSCC Replacement life cycle determination	2007-
2008	
PSCC Replacement cycle plan	2008-
2009	
Replacement cycle fund establishment by governing board	
2010	
First cycle replacement (dependent on cycle plan)—Demo portables	
2012	



First cycle replacement (dependent on cycle plan)—Demo mobiles
2013

It is estimated that the replacement cycle will be 5-7 years for portables, 6-10 years for mobiles, 15 years for base station equipment and consoles.

Point of Contact for this Implement Plan

Mr. Curt Knight
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Public Safety Communications Commission
Mail Drop 3450
PO Box 6638
Phoenix, Arizona
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The information above related to the implementation steps for the new statewide system is important, as it sets an expectation. However, critical to the success of the long-range plan is the establishment of the governing board. The board will champion partnerships between agencies and establish equitable policies. It will determine future funding needs and financial participation needed for all agencies. It will oversee the implementation planning. The governing board is the most crucial element in the implementation of interoperability in the state of Arizona.



7.0 FUNDING

7.0.1 BUDGET DETERMINATION

The statewide budget for the Arizona Interagency plan has not been fully developed as the state is still in the planning phase of the project. Once designed the system budget will be developed and published.

7.0.1 COMMITTED FUNDS

As of today, however, the state has committed funding for a demonstration project (that will determine the future of the state plan). That demonstration project is scheduled for completion in 2008. Additionally, the state has committed funds over the next three years to complete the first phase of the necessary microwave upgrade from analog to digital. As the total budget is unknown, only funds necessary for the demonstration project of the statewide 700 MHz radio system project and for some microwave upgrades have been committed.

7.0.2 COMPREHENSIVE FUNDING STRATEGY

As stated in Section 7.0.1, the statewide system's budget has not been fully developed, and as such a comprehensive funding strategy cannot yet be determined. The PSCC is charged with developing the funding strategy when it is appropriate to do so. The elements to be considered include: using federal grants and funding, using state general funds, user fees, local contributions, possible use of limited federal Highway Transportation funds, and new taxes. The PSCC will recommend a funding strategy to the Arizona Department of Safety, who will forward that recommendation to both the Governor and the Legislature for consideration.

7.0.3 FUNDING FOR STRATEGIC INITIATIVES

There are several strategic initiatives for which funding have been identified. These initiatives include the three phases of upgrading of the state microwave system, the Demonstration Project for the statewide interoperability plan and funding for additional AIRS components. These initiatives will be funded in part with state general funds and in part with federal grants.

7.0.4 SOURCE OF FUNDS, SHORT TERM VS. LONG TERM

Comment [DBH29]: ICTAP – Please help us define the terms “short-term and “long-term.”



To date, the only long-term funded project is the statewide microwave upgrade. The funding source for this project is a combination of state and federal money. As the statewide 700 MHz radio project moves closer to determining actual costs, it is clear that there will be a marked difference between the funding mechanisms for short- and long-term projects. As long-term projects span multiple funding cycles, their funding streams must account for that issue and as the statewide radio project will include multiple jurisdictions, it is likely that user fees will supplement the state's level of funding.

7.0.5 PLANNED COSTS

The planned costs are currently under development.

7.0.6 IDENTIFYING FUNDING SOURCES

The PSCC does not actively solicit grant funding for their projects. Projects are typically funded either with State General Funds, or by the use of grant funds, when the PSCC becomes aware of such an option. As the statewide project becomes more of a reality, additional emphasis will be place on this activity.

7.0.7 GRANT APPLICATIONS

The state has applied for Homeland Security Grants to foster interoperable communications. It is anticipated that the state will continue to do so.

7.0.8 FUNDING FOR COMMUNICATIONS EQUIPMENT PURCHASES, MAINTENANCE, UPGRADES

This PSIC grant includes investment justifications for communications equipment and upgrades. This equipment is necessary to promote interoperable communications in the state of Arizona.

7.0.9 REIMBURSEMENTS FOR EMERGENCIES

All state and local entities are reimbursed for expenditures that they encumbered while assisting others during a mutual aid deployment. This reimbursement would include for example a county deploying a communications van to another county. The responding jurisdiction would be entitled for all expenses including (and not limited to) those for the vehicle, the driver, the technician, repair to damages sustained during deployment, and any other reasonable expenses because of the deployment.



7.0.10 FUNDING FOR THE STATEWIDE COORDINATOR

The state of Arizona, understanding the need for a statewide coordinator for interoperable communications, has funded this position for the last seven years. There are no expectations that this will change.

7.0.11 EXPENSES BY THE COMMITTEE

Expenses incurred by the PSCC are reimbursable pursuant to the enabling legislation creating this group. Expenses for the SIEC are not reimbursable.

7.0.12 EXPENSES FOR TRAINING AND EVALUATION

If training is a requirement of the United States Department of Homeland Security (U.S.D.H.S), all expenses for that training will be paid by the U.S. DHS. Other training is the responsibility of the governmental agency requesting the training.

7.0.13 ENSURING PSIC-FUNDED EQUIPMENT COMPLIES WITH THE STATE PLAN

Before any grant monies is approved, an *ad hoc* committee comprised of radio technology subject matter experts and tasked with reviewing the entire grant applications submitted to the state SAA will be appointed. The Committee will ensure the technologies that entities are requesting will comply with the statewide plan. Once approved, equipment may then be purchased by the local jurisdiction. These purchases will be reimbursed only if the equipment ordered was approved by the committee.

7.0.14 ONGOING FUNDING OF FOR OPERATIONS AND MAINTENANCE/UPGRADE OF PSIC-FUNDED EQUIPMENT

All ongoing funding for both operation and maintenance or upgrades of equipment purchased with PSIC-funds will be the responsibility of the entity who receives this equipment.



8.0 CLOSE

The Arizona Statewide Communications Interoperability Plan provides an overview of the state of Arizona, its demographics and geographic features. It also describes its emergency response community, current radio systems, current operations standards and protocols, and the state's overall plan for the future. It is the state's goal to provide a SAFECOM "standards-based common infrastructure" level of interoperability to all public safety agencies and entities by the year 2013, as well as a means for providing interoperability for those local, county, tribal and non-governmental entities not wishing to join the common infrastructure. This new system will provide seamless compatibility with every regional or metropolitan infrastructure for additional interoperability

8.01 NEXT STEPS

Under the watchful eye of the PSCC and SIEC, the state will establish a governance board for this new interoperability system to institute policies, standard operating procedures, and a revenue stream to fund its continued operation and eventual replacement. All measures taken, such as demonstration projects, the AIRS network, microwave upgrade, and current procedures based on NIMS and other protocols will be intended to move the state toward this goal.

The state will continue to apply for grants and legislative funding with the sole purpose of achieving the "standards-based common infrastructure" level of interoperability required to safeguard the lives and property of the citizens of Arizona. As funding becomes available, the AIRS network will be expanded and its coverage will be improved. The state microwave network will be upgraded to digital, link-by-link. Dispatch centers will be upgraded to accommodate the statewide system and AIRS dispatching. The statewide 700 MHz sites will be installed. The statewide system will be brought on line under the care and management of a governing board, under the direction of the PSCC.



APPENDIX A – AIRS PLANS AND POLICIES

The following pages show the AIRS Plan and frequency standards:

The Arizona Interagency Radio System (AIRS) State Plan (4 pages)

VHF Minimum Equipment Standards

AIRS Channel Assignments

UHF Minimum Equipment Standards

Radio Programming Guide



ARIZONA INTERAGENCY RADIO SYSTEM (AIRS) STATE PLAN

PURPOSE

The Arizona Interagency Radio System (AIRS) is designed to provide interoperable communications capability to first responders of police, fire, and EMS agencies, as well as other personnel of municipal, county, state, tribal, federal agencies and approved non-governmental organizations (NGO's) performing public safety activities. This system operates on designated interoperability frequencies.

These radio frequencies are to be used in the event of a multi-jurisdictional operation requiring the use of the common state radio channel(s), specifically for the use of coordinating activities during identified incidents. AIRS frequencies are not to be used by a single agency for routine public safety operations.

The Arizona Statewide Interoperability Executive Committee (SIEC) shall serve as the state plan governing entity.

DEFINITIONS

AIRS:	Arizona Interagency Radio System (Previously known as AERS - Arizona Emergency Radio System)
FCC:	Federal Communications Commission
IC:	Incident Command. The overall authority and control for the incident.
ICS:	Incident Command System
Incident:	An event or occurrence requiring the participation and coordination of more than one public safety first responder agency requiring the services of more than one agency.
Interoperability:	The ability of public safety officials to share information via voice and data signals on demand, in real time, when needed, and as authorized.
MOU:	Memorandum of Understanding
NGO:	Non-governmental organizations. NGO's are considered field users and shall adhere to field user responsibilities as defined herein.
NIMS:	National Incident Management System



Plain Language:	Common English used to convey the message without the use of radio codes.
PSAP:	Public Safety Answering Point. A Public Safety Answering Point is also known as a 9-1-1 Center, Dispatch Center, or Fire Alarm Office (FAO), where public safety radio and telephone communication services are provided 24 hours, 7 days per week.
SIEC:	Statewide Interoperability Executive Committee
System Failure:	Anything that interrupts the flow of communications or limits the communications within the situation.

ELIGIBILITY FOR PARTICIPATION

1. Governmental agencies and NGO's, utilizing mobile and portable two-way radios, operated by personnel actively engaged in incident-related activities, are eligible to apply for operating authority.
2. Each participating agency shall be responsible for maintaining a Memorandum of Understanding with the SIEC for operation on the appropriate AIRS frequency.
3. By federal statute, federal agencies are required to obtain permission to use the AIRS frequencies through the National Telecommunications and Information Administration, unless a supporting agency provides all the mobile radios for the federal agency's use.

OPERATIONAL GUIDELINES

Channel Use

The established priority-use levels for the system are described below. When a higher priority of use is required, all lower priority use must cease in ANY area where interference could occur.

The four priority levels are:

- | | |
|-------------|---|
| PRIORITY 1: | Disaster and extreme emergency operations of large scale; for mutual aid and interagency communications. |
| PRIORITY 2: | Emergency or urgent operations involving imminent safety of life or property. |
| PRIORITY 3: | Special event control activities, generally of a pre-planned nature, and involving joint participation of two or more agencies. |
| PRIORITY 4: | Drill, maintenance, and test exercises. |



Communication Center Responsibilities

1. General Responsibilities
 - a. Continuously monitor AIRS channel
 - b. Provide communication center staff training
 - c. Conduct periodic documented testing of AIRS
2. Incident Communications Center Responsibilities
 - a. Monitor and respond on AIRS channel(s)
 - b. Maintain dispatch documentation
 - c. Record audio and telephone traffic of event
 - d. Coordinate other agency unit response as requested or necessary
 - e. Resume general AIRS operations and notify involved agencies at termination of incident.
3. Contingencies for System Failure
 - a. The primary dispatch communication center shall attempt alternate communication methods.
 - b. If the primary dispatch center is unable to establish alternative communication methods, dispatch responsibilities will be transferred to the next appropriate communication center.

Command and Control Responsibilities

1. Incident Command Responsibilities
 - a. Establish ICS or NIMS protocol.
 - b. Identify IC and notify incident Communication Center. Under normal conditions, the agency initiating the request for interagency assistance shall assume incident command. Should the initial agency become unable to continue as IC, command will transfer to the next appropriate agency.
 - c. Identify nature of incident and request appropriate resources.
 - d. Utilize state plan priority levels to identify need.
 - e. Identify other support channels to be utilized for ICS or NIMS.
 - f. Use plain language, avoiding agency-specific radio codes.
 - g. Provide periodic update to Communications Center.
 - h. Enforce radio discipline.
 - i. Advise when incident is terminated.
 - j. Conduct briefing of planned events. Attendees should include operational and support representatives from all involved agencies.
 - k. Conduct debriefing with operational support representatives involved in the incident.
2. Contingencies for System Failure
 - a. The IC shall establish a plan for alternative communication methods in the event of a system failure.



Field User Responsibilities

Field Users shall:

1. Operate within ICS or NIMS protocol.
2. Identify themselves by agency name and call sign (DPS200 or Mesa Fire Engine 201).
 - a. Agencies without calls signs should identify by organization and individual's name (Red Cross, Jones).
 - b. Nothing in this policy should preclude pre-planned, site specific/incident assignment calls signs.
3. Keep radio traffic to a minimum and use plain language.
4. Be available on the assigned channel.
5. Contingencies for System Failure
 - a. Field Users shall follow the established IC alternative communication plan.





STATEWIDE INTEROPERABILITY EXECUTIVE COMMITTEE

TITLE: VHF MINIMUM EQUIPMENT STANDARDS

DATE January 23, 2007

POLICY # 06-001

REV # 1.1

Replaces Policy # 06-001 rev 1.0

The Arizona Statewide Interoperability Executive Committee (SIEC) continually works to develop guidelines, recommendations and standards intended to promote public safety interoperable radio communications for all Arizona first responders.

The SIEC has standardized certain radio features, nationally recognized to promote and maintain a higher level of interoperable communications among and between public safety jurisdictions and disciplines. All public safety agencies are strongly encouraged to meet or exceed these minimum qualifications when purchasing mobile and portable radio equipment. The SIEC recommends all equipment purchased through Homeland Security grants be required to meet no less than these minimum qualifications.

VHF MOBILE – PORTABLES MINIMUM STANDARDS

MINIMUM CHANNEL	CHANNEL DISPLAY	FREQ RANGE	NARROWBAND CAPABLE	PROJECT 25 CAPABLE
48 CH OR GREATER	7 CHAR OR GREATER	150MHz-174MHz	REQUIRED	UPGRADEABLE REQUIRED





STATEWIDE INTEROPERABILITY EXECUTIVE COMMITTEE

TITLE: Arizona Interagency Radio System (AIRS)
Regional Channel Assignments

DATE January 23, 2007

POLICY # 06-003

REV # 1.2

Replaces Policy #06-003, Rev. 1.1

AIRS REGIONAL CHANNEL ASSIGNMENTS



*Refer to Arizona Statewide Interoperability Executive Committee (SIEC) Policy #07-005 (Subscriber Programming Guide) for detailed radio programming information.





STATEWIDE INTEROPERABILITY EXECUTIVE COMMITTEE

TITLE: UHF MINIMUM EQUIPMENT STANDARDS

DATE January 23, 2007

POLICY # 06-002

REV # 1.1

Replaces Policy # 06-002 rev. 1.0

The Arizona Statewide Interoperability Executive Committee (SIEC) continually works to develop guidelines, recommendations and standards intended to promote public safety interoperable radio communications for all Arizona first responders.

The SIEC has standardized certain radio features, nationally recognized to promote and maintain a higher level of interoperable communications among and between public safety jurisdictions and disciplines. All public safety agencies are strongly encouraged to meet or exceed these minimum qualifications when purchasing mobile and portable radio equipment. The SIEC recommends all equipment purchased through Homeland Security grants be required to meet no less than these minimum qualifications.

UHF MOBILE – PORTABLES MINIMUM STANDARDS

MINIMUM CHANNEL	CHANNEL DISPLAY	FREQ RANGE	NARROWBAND CAPABLE	PROJECT 25 CAPABLE
48 CH OR GREATER	7 CHAR OR GREATER	450MHz-470MHz	REQUIRED	UPGRADEABLE REQUIRED





STATEWIDE INTEROPERABILITY EXECUTIVE COMMITTEE

TITLE: SUBSCRIBER PROGRAMMING GUIDE -
ARIZONA MUTUAL AID and INTEROPERABILITY
CHANNELS

DATE January 24, 2007

POLICY # 07-005

Replaces Policy # 07-005 rev. 1.0 per ARRC
decision on 01/24/2007

REV # 1.1

VHF CHANNELS

AZ-SIEC NAME	BAND- WIDTH	TX FREQ MHz	TX CTCSS Hz	RX FREQ MHz	RX CTCSS Hz	NCC NAME
AIR5AZ	25 KHZ	155.190	156.7	155.475	CSQ	
AIR51	25 KHZ	155.190	141.3	155.475	CSQ	
AIR52	25 KHZ	155.190	131.8	155.475	CSQ	
AIR53	25 KHZ	155.190	110.9	155.475	CSQ	
AIR54	25 KHZ	155.190	123.0	155.475	CSQ	
AIR55	25 KHZ	155.190	167.9	155.475	CSQ	
VAIR5_D	25 KHZ	155.475	156.7	155.475	CSQ	1LAW16
VCALL	12.5 KHZ	156.7625	156.7	155.7625	CSQ	1CAL18
VTAC1	12.5 KHZ	151.1375	156.7	151.1375	CSQ	1TAC5
VTAC2	12.5 KHZ	154.4625	156.7	154.4625	CSQ	1TAC13
VTAC3	12.5 KHZ	156.7375	156.7	156.7375	CSQ	1TAC22
VTAC4	12.5 KHZ	156.4725	156.7	156.4725	CSQ	1TAC23

UHF CHANNELS

AZ-SIEC NAME	BAND- WIDTH	TX FREQ MHz	TX CTCSS Hz	RX FREQ MHz	RX CTCSS Hz	NCC NAME
AIR5AZ	25 KHZ	465.375	103.0	460.375	CSQ	
AIR51	25 KHZ	465.375	141.3	460.375	CSQ	
AIR52	25 KHZ	465.375	131.8	460.375	CSQ	
AIR53	25 KHZ	465.375	110.9	460.375	CSQ	
AIR54	25 KHZ	465.375	123.0	460.375	CSQ	
AIR55	25 KHZ	465.375	167.9	460.375	CSQ	
UAIR5_D	25 KHZ	460.375	103.0	460.375	CSQ	
UCALL	12.5 KHZ	453.2125	156.7	453.2125	CSQ	4CAL27
UCALL_D	12.5 KHZ	453.2125	156.7	453.2125	CSQ	4CAL27D
UTAC1	12.5 KHZ	453.4625	156.7	453.4625	CSQ	4TAC26
UTAC1_D	12.5 KHZ	453.4625	156.7	453.4625	CSQ	4TAC26D
UTAC2	12.5 KHZ	453.7125	156.7	453.7125	CSQ	4TAC28
UTAC2_D	12.5 KHZ	453.7125	156.7	453.7125	CSQ	4TAC28D
UTAC3	12.5 KHZ	453.8625	156.7	453.8625	CSQ	4TAC30
UTAC3_D	12.5 KHZ	453.8625	156.7	453.8625	CSQ	4TAC30D

800 MHz CHANNELS

AZ-SIEC NAME	BAND- WIDTH	TX FREQ MHz	TX CTCSS Hz	RX FREQ MHz	RX CTCSS Hz	NCC NAME
AIR5AZ	20 KHZ	821.0125	156.7	895.0125	CSQ	8CAL90
AIR51	20 KHZ	821.0125	141.3	895.0125	CSQ	8CAL90
AIR52	20 KHZ	821.0125	131.8	895.0125	CSQ	8CAL90
AIR53	20 KHZ	821.0125	110.9	895.0125	CSQ	8CAL90
AIR54	20 KHZ	821.0125	123.0	895.0125	CSQ	8CAL90
AIR55	20 KHZ	821.0125	167.9	895.0125	CSQ	8CAL90
8AIR5_D	20 KHZ	895.0125	156.7	895.0125	CSQ	8CAL90D
8TAC1	20 KHZ	821.5125	156.7	895.5125	CSQ	8TAC91
8TAC1_D	20 KHZ	895.5125	156.7	895.5125	CSQ	8TAC91D
8TAC2	20 KHZ	822.0125	156.7	897.0125	CSQ	8TAC92
8TAC2_D	20 KHZ	897.0125	156.7	897.0125	CSQ	8TAC92D
8TAC3	20 KHZ	822.5125	156.7	897.5125	CSQ	8TAC93
8TAC3_D	20 KHZ	897.5125	156.7	897.5125	CSQ	8TAC93D
8TAC4	20 KHZ	823.0125	156.7	898.0125	CSQ	8TAC94
8TAC4_D	20 KHZ	898.0125	156.7	898.0125	CSQ	8TAC94D
8TAC5	20 KHZ	821.0375	156.7	895.0375	CSQ	
8TAC5_D	20 KHZ	895.0375	156.7	895.0375	CSQ	





STATEWIDE INTEROPERABILITY EXECUTIVE COMMITTEE

TITLE: Regional VHF Tactical Channel
Assignments

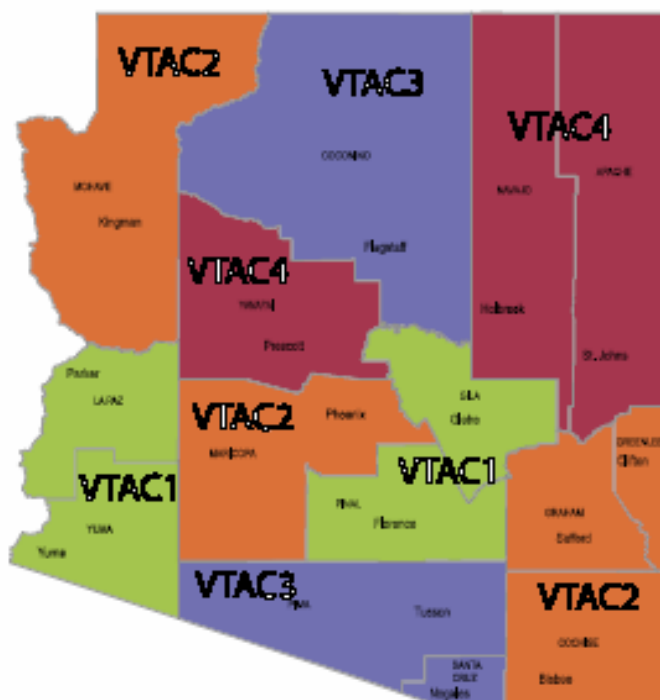
DATE January 23, 2007

POLICY# 06-004

REV# 1.1

Replaces Policy #06-004, Rev. 1.0

REGIONAL VHF TACTICAL CHANNEL ASSIGNMENTS



*Refer to Arizona Statewide Interoperability Executive Committee (SIEC) Policy #07-005 (Subscriber Programming Guide) for detailed radio programming information.









